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NEW YORK—THURSDAY, SEPTEMBER 6, 1923

No. 10

Good Fall Business in South Seems Certain

Cotton crop probably will exceed that of last year and will be sold at satisfactory prices. Situation in North Carolina particularly favorable. Car sales should be greater than in 1922. Boll weevil causes considerable trouble in some districts.

By R. H. Bethea

TWO weeks ago we printed a brief general summary of business conditions in the South, which indicated that a good market for motor vehicles is likely to exist below the Mason-Dixon line during the next twelve months.

The present article confirms the previous report and analyzes the Southern situation in detail. Strong and weak points are mentioned specifically and reasons are given for present conditions in each State.

THE South occupies a strong economic position at the present time. The past year has been one of exceptional prosperity. Bank deposits of all kinds have increased, savings deposits having grown proportionately more than open accounts. The size of the cotton crop is being estimated at various figures, but everyone agrees that it will be at least equal to that of last year. Manufacturing facilities in the South are increasing steadily and most of them compare favorably with like industries in other sections. If the rest of the country has even reasonable prosperity, the South will continue its rapid advance. Sales of automobiles throughout the Southern States will be larger during the next year than in any like period in the past, barring a collapse in other parts of the country.

Estimates of total cotton production this year vary, the greatest speculation being in connection with Texas and Oklahoma. Estimates of production outside of these two States range between 6,200,000 and

6,800,000 bales. Production in Texas and Oklahoma varies from 3,850,000 to 5,750,000 bales, so that estimates for the total crop range from 10,050,000 to 12,550,000 bales. Predictions made at this time last year placed the crop to be expected at about 11,000,000 bales. The final crop harvested was around 9,780,000 bales.

IN Texas they have a saying that the person predicting the weather in any part of that State is "a fool or a newcomer." Predicting the cotton crop for Texas is somewhat the same as predicting the weather. A drought in Texas is a terrible thing to contemplate. The so-called "four years drought" which affected the territory south of San Antonio during 1918, killed cattle and crops, dried up streams and devastated the entire area, leaving practically nothing but horned toads and cactus; the cactus saved a few of the herds. It is to be hoped that no drought will ruin the excellent

prospects which now exist for good crops in Texas and Oklahoma.

Cotton production in Arizona and California usually is negligible and, consequently, can be left out of calculations regarding the total cotton crop.

Of the other States in the cotton belt, North Carolina is rated high this year, comparatively speaking. This State produced about 830,000 bales in 1922, while its 1923 output will be about 900,000 or 1,000,000 bales.

BOLL WEEVIL damage in North Carolina is not serious, weather conditions are excellent, and no other pests have developed to cause the farmer serious trouble. This State has prospects of an excellent yield of practically all other crops, the value of which, as usual, will be higher than that of any of the other Southern States.

The cotton crop in South Carolina again has been heavily infested with the boll weevil. Moreover, weather conditions were particularly bad until the two weeks from Aug. 6 to 19. Better weather in that period gave the Piedmont section of the State a new lease on life and greatly helped the prospects for cotton. Estimates place the South Carolina crop between 675,000 and 725,000 bales. This indicates an increase of 100,000 or 150,000 bales over 1922. This State is in good condition in spite of heavy blows received in the past year. An excellent market for cars should exist in the Piedmont section around Greenville, and in the eastern section around Bennettsville, Marion and Dillon.

Georgia is again the heaviest sufferer from the boll weevil, while shortage of labor has been a decided drawback in efforts to fight the army worm. The boll weevil has been particularly active in Southern Georgia. Weather conditions have been favorable to it and unfavorable to crops practically all over the State. Peach, corn and other crops have suffered severely in Georgia.

Georgia's cotton production probably will be between 750,000 and 800,000 bales, although a few observers think that it will run as high as 825,000 bales. These predictions indicate that Georgia will grow between 25,000 and 75,000 more bales than it did in 1922. A high price for cotton would make many sections of the State quite prosperous and thus provide a good market for cars. The northern part of Georgia is in good financial condition, relatively speaking, at the present time.

WHILE the Florida cotton crop has been described as "ruined," this State probably will produce about 20,000 bales of cotton this year, as against 25,000 bales last year. To make up for this slight deficiency in cotton, all other crops in Florida are excellent, so that the total value of crops for the entire State will be far ahead of the average for the last ten years. Consequently, Florida should be a good market for passenger cars during the next twelve months.

The Alabama cotton crop is in fairly good condition this year. It probably will yield about 900,000 bales, as against 813,000 bales last year. The boll weevil is active, however, in South and Central Alabama and weather conditions have been bad in these sections. Having completed its first visit, the army worm is due for a return trip about the last of August or the first of September in many counties.

Crops other than cotton have not been as good as they were last year, and the buying power of the State will be determined very largely by the price received for the cotton crop. If the cotton is sold for slightly more than it was last year, the total loss in crop value for the State will not be very great.

Alabama offers a reasonably good market for automobiles during the next six months, the Tennessee Valley section offering the best prospect. Those counties which contain Huntsville, Albany, Decatur, Florence and Sheffield, should be particularly fertile fields for sales effort. Other areas in which sales prospects are bright include Tuskaloosa County, the section around Montgomery and the districts near Selma. Baldwin County produced large crops this year and should be an important factor in making the Mobile territory profitable from a sales standpoint.

The Tennessee cotton crop is late this year, but is expected to equal or surpass last year's, which was 400,000 bales. Both the army worm and the boll weevil have been giving some trouble, but taken as a whole the State is having a prosperous year. Motor vehicle sales should be especially good in the territories surrounding Knoxville, Memphis and Chattanooga, while the Nashville district also should produce a reasonable amount of business.

The cotton crop is late in Mississippi, as well as Tennessee. The boll weevil has made its appearance in nearly every part of the State and the total cotton production for the State probably will fall below that of last year, when the output was 1,010,000 bales. Estimates as to how large the decrease will be run from 10,000 to 85,000 bales.

CROPS of all kinds are less this year than in 1922, but if cotton can be sold for 2 cents a pound more than last year the total crop value will compare favorably with that of the previous twelve months. The best market in Mississippi for the time being seems to be around Clarksdale, Greenwood, Greenville and Yazoo City.

The Arkansas cotton crop is in about the same condition as it was last year, except that it is somewhat late in the eastern part of the State and that the boll weevil is doing considerable damage in some southern and central areas. In 1922 Arkansas produced about 1,000,000 bales of cotton, while its output this year is estimated at 950,000 or 1,000,000 bales. Crops other than cotton have fallen off in Arkansas, so that the buying power of the State in general cannot be expected to be much better than it was last year.

Missouri's crops as a whole are in excellent shape. Cotton production this year will be about 150,000 bales, as against 145,000 last year, and there is every indication that the cotton belt in this State will be a good market for automobiles next year. Charleston, Campbell and Poplar Bluff are among the chief places in this area.

Cotton production in Louisiana will be a little bit less than the 350,000 bales grown last year. Other crops also are slightly smaller than in 1922, but run very close to the average for the last ten years. The farming sections of the State are likely to be prosperous next year, while New Orleans, always a good market for automobiles, will continue to absorb its quota of vehicles.

IF 11,000,000 bales of cotton are produced this year, the cotton supply of the world will be about equal to that of last year. Cotton stocks in the United States amounted to 2,831,583 bales on July 31, 1922, while the carry-over on July 31, 1923, was 2,087,919 bales. This latter figure includes more imports than usual. These figures indicate a reduction in stock of 750,000 bales.

The cotton acreage planted this year exceeded that of 1922 by 2,000,000 acres, making slightly less than 1/16 increase in total acreage. About 4,000,000 tons of fertilizer were used in the cotton States this year, as com-

pared with 3,300,000 tons in 1922. These two facts, together with the excellent conditions prevailing in Texas and Oklahoma at the beginning of the cotton year, are largely responsible for the belief that cotton production as a whole will be increased greatly this year.

The boll weevil, drought, the army worm, shortage of labor and bad weather conditions may result in a large number of individual failures here and there in the cotton belt. Generally speaking, however, the farmers will be prosperous again this year, unless something entirely unforeseen happens and forces down the price of cotton.

WHILE general prosperity seems assured, it is true that the cost of producing cotton has risen considerably. Farmers in the Southeast, for instance, have been working under heavy expenses because of the necessity for fighting the boll weevil, the army worm and the weather. Their fertilizer costs have increased something like \$25,000,000, while benefits from the fertilizer have been materially decreased by bad weather conditions. Labor shortage has resulted in higher wages.

Taken as a whole, cotton producers are in a strong position. If the total 1923 crop does not exceed 11,000,000 bales, and few think that it will, the farmer should receive about 25 cents for his crop. If this turns out to be the case, good times are assured throughout the South and automobile sales undoubtedly will be larger than ever before.

Should the crop exceed expectations and reach a total of 12,000,000 bales, there is little reason to believe that the price would fall below 20 cents. Under these circumstances Texas and Oklahoma, which would necessarily produce a large crop, would have a year of wonderful prosperity, while the Southeast cotton States would be fairly well off as well.

FARM prospects are bright throughout the entire South, because only a small supply was carried over from last year of the products grown in these sections.

Prospects for prosperity are not quite as good in the southern manufacturing areas as in the farm districts, because there has been a considerable slump in the market for building materials since April 30. Demand for lumber has declined steadily since May 1, and the price also fallen off.

Back orders have kept most of the lumber plants going full force to date, but new orders will be needed from now on to keep them in operation.

Textile mills throughout the South are working full time and have a little more business than at this time last year. Recent improvements in textile markets all over the country are reflected in the southern section of the industry.

Iron and steel are holding their own as regards both prices and production. Pig iron is quoted at \$27 at Alabama furnaces. Full-time operations are contemplated throughout the third quarter, but relatively light orders indicate some falling off in production during the last three months.

Other manufacturing interests, such as cement, are having more or less trouble to keep their sales high enough to insure continued operation at peak loads. Coal production has been good during the summer months, particularly in the Birmingham districts where an average of 350,000 tons a week has been maintained.

While southern manufacturing plants are not entirely dependent upon domestic buying, because of the large textile sales made annually to the Orient, their prosperity does rest fundamentally on the ability of other

sections of the United States to absorb a large part of their products.

The value of cotton mill securities in the Carolinas has increased materially on the strength of purchases by Northern interests of plants in that section. The districts affected by this trend include the following: Greenville, Charlotte and other districts in the Carolinas; Gainesville and Columbus districts in Georgia; Huntsville and Alexander City districts in Alabama. Construction of many new mills and installation of new equipment in old ones is having a favorable influence in the two sections last mentioned.

Lumber is the only commodity in the South which has suffered a real price decline up to the present time. The price of other products has fallen off temporarily from time to time but has recovered in almost every instance. The price of lumber started down about April 1, however, and has dropped off from 20 to 35 per cent on practically all grades. Should building activities take a spurt this fall, the demand for lumber will grow very rapidly, since stocks throughout the country are low. Improvement in lumber prices and demand would have a particularly favorable effect on the buying power of the following sections: the larger part of Louisiana, southern Mississippi, southern Arkansas, southern Alabama, a few scattered areas in central and northern Alabama, southeastern Texas, parts of southern Georgia and northern Florida.

IRON, steel and coal affect business conditions principally in the Birmingham and Chattanooga districts. The situation in Birmingham is excellent at the present time. A few oil pipe companies have closed down and some of the structural steel plants face decline in production if orders do not start to come in, but, on the whole, operations have been highly satisfactory and prices have held up well.

What is true of Birmingham is true also of Anniston, Gadsden, Tuscaloosa and to an extent of Sheffield and Walker Counties.

Water power development has been rapid during the past year in practically all of the Southeastern States. Notable achievements along this line include completion of the Wilson dam by the Alabama Power Co., beginning of construction of a similar dam on the Tallapoosa River, and other operations of less pretentious character, the combined cost of which will range between \$10,000,000 and \$12,000,000.

Road development in the South has gone forward at a good pace. Extensive highway building has been carried forward in Georgia and Tennessee. Progress in Alabama has been so great that many farmers who once had trouble in getting through the State in a one-horse wagon drawn by mules can now use automobiles.

ROAD development has been very extensive in Louisiana, special attention having been given to arterial highways running across the State. Only in Arkansas has highway construction been in abeyance.

The Southern farmer is in a particularly strong economic position this fall. A majority of these farmers should be able to handle all of their obligations and buy an automobile if they care to do so.

An unqualified statement as regards the number of cars the South should absorb in any given period is difficult to make because the sale of motor vehicles depends upon various factors, as has been pointed out. It is reasonable to say, however, that the South as a whole is economically as well off as any other part of the country and in some respects it is better situated.

1924 Oakland Model Differs Radically from Previous Design

L-head engine replaces overhead valve type previously used. Four-wheel brakes and combustion chamber of the Ricardo type are new features. Mechanical units are changed throughout. Frame is stiffened materially.

By W. L. Carver

COINCIDENT with the adoption of four wheel brakes, the Oakland Motor Car Co. has brought out an entirely new car. The former overhead valve engine has been supplanted by an L-head engine having a combustion chamber of the well-known Ricardo type, which induces maximum turbulence. The same bore and stroke have been retained, but the turbulence feature, in combination with other improvements, has resulted in an increased power output at wide-open throttle throughout the speed

range. The frame has been stiffened, particularly against torsional deflection, by the use of thicker side channels of lesser depth and by the addition of cross members, including a tubular member between the front spring horns.

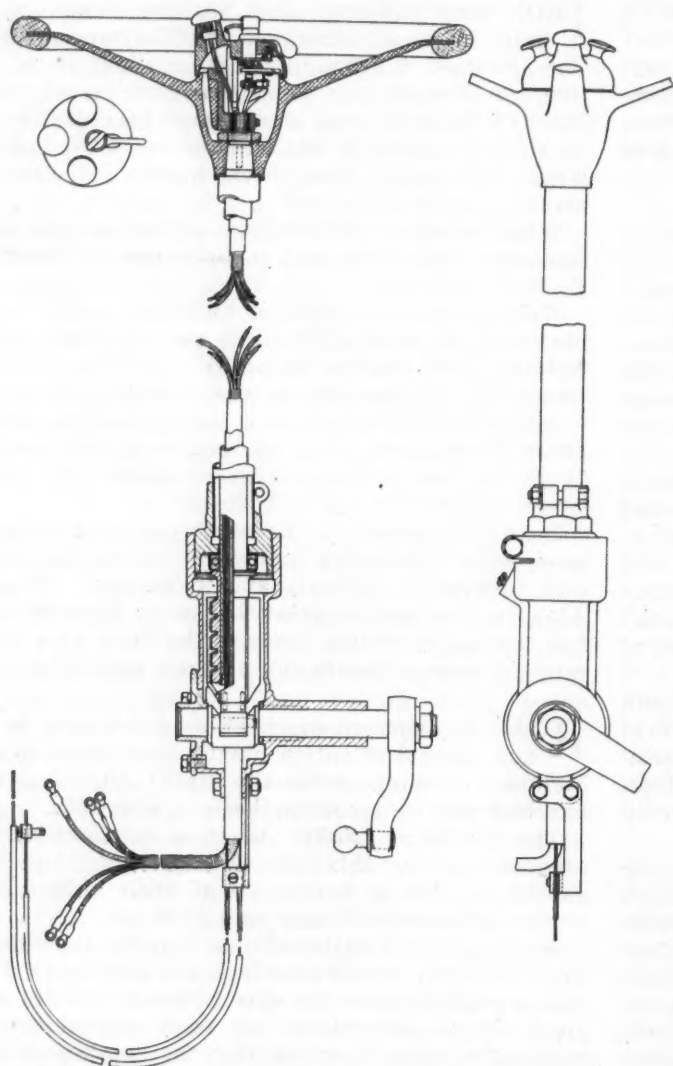
New mechanical units are found throughout, each having been designed to harmonize with the new engine and the four wheel braking system. The weight of the gearbox is somewhat less, notwithstanding the fact that the gears and bearings are laid out to carry the greater loads resulting from the increased power. A 9-in. open type Hoosier clutch is the connecting link between the engine and gearbox, which latter now carries a 6-in. diameter emergency brake on the tail shaft. The semi-floating rear axle is claimed to be stronger. In spite of the addition of brakes on the front wheels, the total weight of the car is within a few pounds of that of the former model.

New Body Models

In addition to the mechanical improvements, several novel features are to be found in the new bodies. All controls have been removed from the instrument board and are now located in a single unit at the top of the steering column. A rectangular glass panel at the center of the instrument board incloses the ammeter and the oil pressure and gasoline gages, with interior illumination. The frame has been lowered and the open body sides have been made higher, making for better protection from dust. A new type of close-fitting glass inclosure is offered as extra equipment for use with the permanent tops on all open models. By this arrangement the advantages of the open car for summer driving are combined with neat, "built-in" protection for winter service. These panels can be installed in a few minutes.

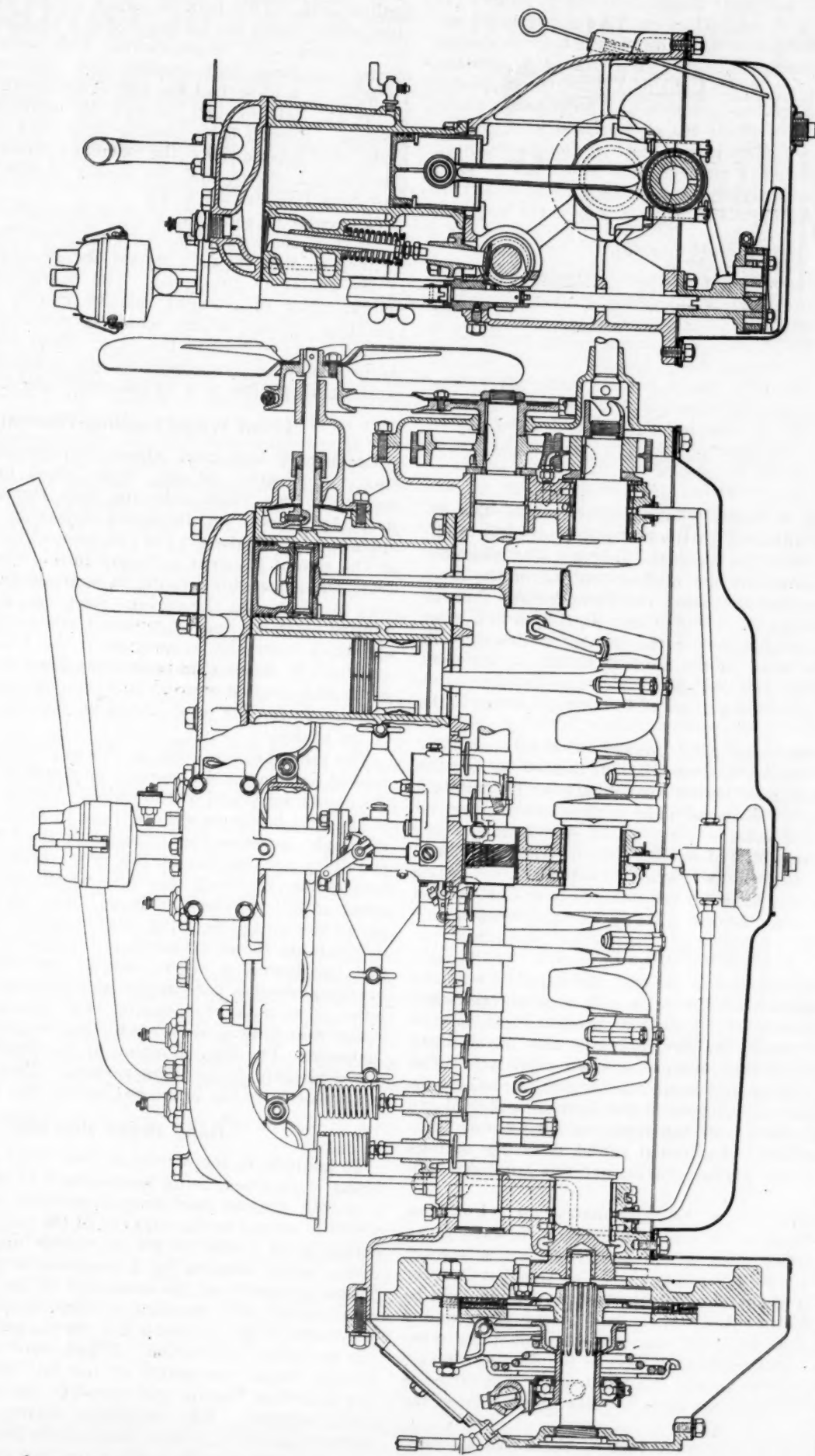
The four-wheel braking system adopted is different from any other now in use in this country. No equalizers are provided, all four brakes being adjusted individually. The linkage to the front wheels is designed to eliminate locking by the release of pressure at the front brakes. In conjunction with this feature the centers of the universal joints that actuate the front brakes are offset from the knuckle axis to cause an increased release of the outer brake while making a turn.

A rod connects the pedal lever, of approximately 13 in. effective radius, with the lower end of a lever clamped on a tubular cross shaft which is located under the intermediate cross channel. The cross shaft is supported in bearings

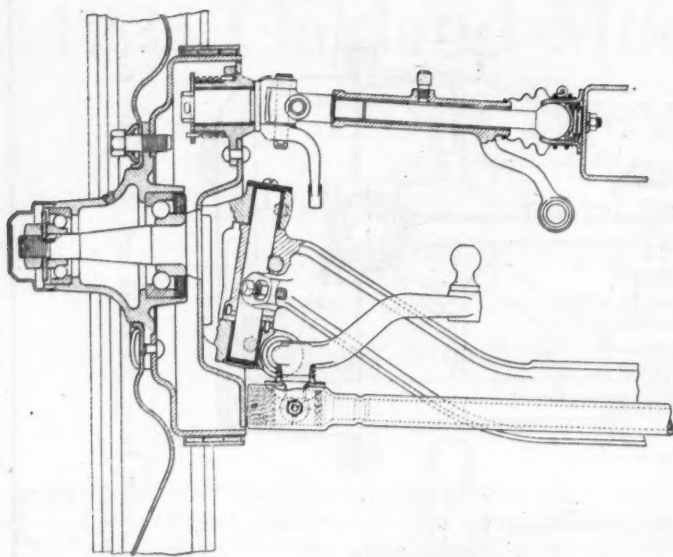


Steering gear assembly showing control head

Assembly Views of New Oakland L-Head Engine



The features of this engine are the L-head form of cylinders with Ricardo type of compression chamber, the crankcase split below the crank axis, the heavy three-bearing crankshaft with pressure lubrication and the slight incline of the valves



Front wheel brake, showing unequal length of sections

at three points, a bracket being riveted into the inverted channel adjacent to the operating lever, in addition to which there are brackets on both side channels. Double ended levers are mounted at the end of the cross shaft, the upper end operating the front brakes through a linkage, while the lower end is connected by a link to an intermediate lever mounted on the rear axle. Although the two ends of the lever on the cross shaft are of different lengths, owing to the change in leverage by the intermediate lever arms the pull on all brake band levers is the same.

All of the brake operating linkage, with the exception of the first link and the cross shaft, is located outside the frame but is concealed by the shroud between the running board and body. External band brakes are used at all four wheels, the outside diameter of the drums being $12\frac{1}{4}$ in. and the width of bands, $1\frac{7}{8}$ in. The rear bands have approximately a half wrap while the front bands have a five-eighths wrap for reasons which will be covered in the discussion of the operation of the front brakes.

Intermediate Lever

The intermediate lever at the rear end together with the rest of the brake mechanism is carried on a stamped steel plate and is connected by a short pressed steel link to another lever which in turn operates the brake band clamping lever through another pressed steel link. The usual release spring and hand adjustment are located in front of the axle. A support in the form of a slotted eye belt takes the reaction of the releasing spring and tends to prevent rattling. Additional radial releasing springs are provided in the anchor bracket and two auxiliary supports.

From the upper end of the cross shaft lever, a link having an integral clevis at each end extends forward to an intermediate idler lever which is carried on a bracket riveted to the side channel alongside of the rear pair of cylinders. For the sake of simplicity only one side will be described. Another link with a ball at the front and a threaded yoke at the rear end connects this idler lever with the inner brake operating lever of the floating connection between the frame and the front axle. The latter is of somewhat conventional form, as may be seen from the illustration.

The lower leg of the outer fork of the universal joint is extended to form a lever which extends downward and

operates the brake band clamp lever through an intermediate link. This fork is forged at the inner end of a short shaft which has its bearing in a bracket riveted into the stamped steel brake carrier and cover. A helical spring surrounds this bracket, and, because of its application to a washer at the end of the short shaft, serves to prevent rattling and returns the lever to the release position. Beyond the clamping lever, the details of the brake are substantially the same as these of the rear construction, except that the anchor location is moved to provide a five-eighths wrap.

The center of rotation of the universal joint is slightly offset from the axis of the steering pivot, the latter being inclined so that its axis strikes the ground $\frac{3}{4}$ in. inside of the center of the tread. The operation in different planes result in a slight relative motion of the brake operating linkage as the wheel is moved around. This motion tends to release the outer brake while turning a corner and therefore eliminates the possibility of sliding straight ahead due to a locked outer wheel.

Front Wheel Locking Prevented

Locking of the front wheels is prevented in a novel way. Application of any front wheel brake transfers weight to the front axle and this increase in weight naturally causes an increased deflection of the front springs. In this design, the link connecting the idler lever at the side of the rear cylinders to the inner lever at the front end slopes downwardly at a considerable angle from rear to front. As the springs compress, this link swings upward about its rear center and tends to release the inner operating lever and, consequently, the brake, by a slight amount. It is for this reason the front brake bands are given an increased wrap as this compensates for the slight decrease in tension on the band during normal application of the brakes.

The same feature holds good when the brakes are fully applied suddenly. As there is no equalizer in the system the maximum travel of the pedal is limited by the contact of the rear bands as well as those in front. The transfer of weight increases the deflection of the front springs and simultaneously decreases the front braking moment, in consequence of which the front wheels may approach but never attain a locked condition. The included angle between the inner operating lever and the brake rod is the determining factor rather than the angle between the rod and the frame, a slight angular movement of the rod bringing about a very appreciable movement of the brake lever. The makers state that this system has shown excellent handling qualities with any reasonable brake adjustment. The line of action of the front springs is inclined slightly toward the vertical. This angular travel in opposition to the brake rod insures the releasing action.

Hand Brake Provided

In addition to the service or foot brake a hand-operated brake is provided, being located back of the gear box. A 6 in. dia. pressed steel drum is centered on a cast spider which is splined on the rear end of the tail shaft. A double acting band brake of $2\frac{1}{2}$ in. width engages with this drum, being actuated by a compression link from an L-shaped extension of the lower end of the hand lever. The construction also operates a compression spring at the lower end of the operating link for the purpose of cushioning the brake application. A bell crank with its fulcrum directly below the center of the tail shaft supplies the double acting feature and supports the ends of the band while released. Two cantilever springs of round wire anchored to the rear cover bolts of the gearbox and hooked into clips on the brake band at the free ends also assist in

supporting the brake and suppressing rattles. A releasing coil spring, which is hooked between the operating lever and the stamped steel ratchet quadrant, brings the brake back into the open position when the hand lever is moved forward.

As described, two separate and individual braking systems are provided, each being absolutely independent of the operation of the other and effective in either direction of the car's motion. The conditions affecting the operation of the four-wheel brakes in the forward direction are reversed and produce similar results when applying the foot brakes as the car is moving backward.

While the same bore and stroke (2 13-16 in. and 4 1/4 in., respectively) have been retained, the six cylinder engine has been entirely redesigned. The former overhead valve construction has given way to an L-head design, and it is stated that this change alone has resulted in decreasing the number of parts incidental to the valve operating mechanism by 124. As shown in the cross section of the engine, the compression chamber is formed to promote turbulence and to bring the bulk of the compressed charge close to the spark plug. In order to insure a more rigid support for the bearings, the cast iron crankcase is now split 2 5-8 in. below the crankshaft center. Cylinders and valve tappet guides are cast separately and belted to the upper face of the crankcase, the tappet guides being cast in groups of six. As the total depth of the crankcase upper section is in excess of 8 in. and the bell housing is cast integral with it, a rigid structure is insured. The crankcase lower section is formed by a pressed steel pan sloping toward the center where the oil pump and drain plug are located.

Crankshaft Size Increased

The three bearing type crankshaft has been retained but its dimensions have been increased throughout. The sizes of the main bearings (diameter and length) are as follows: Front 2 by 2 in.; center, 2 1-16 by 2 1/2 in.; rear 2 1/2 by 2 3-16 in. End thrust is now taken on the front main bearing by split collars on both ends of the journal. The lower halves of these collars are supported in turned recesses in the bearing cap and rotation is prevented by dowel pins. The upper halves rest on the lower, and all may be removed by dropping the bearing cap. Two different thicknesses are used permitting three possible combinations which limit end play to between 0.0035 and 0.0065 in. The main bearing shells are bronze-backed and lined with a thin layer of babbitt. These bearings are made by the Chadwick process, in which the bearing is burnished to size before delivery to the engine plant and is not touched thereafter. Limits of 0.0005 in. are worked to and the crankshaft is ground to a corresponding degree of accuracy, giving an oil clearance of 0.001 and 0.002 in.

The crankpin bearings are 1 1/2 in. in dia. and 1 1/2 in. long

being lined with a cast-in, tin-bonded babbitt. Oil holes are drilled in the crankshaft, from the main bearings to the adjacent pin bearings and copper tubes convey oil from throws one and six to two and five respectively. The main bearing shells are provided with circumferential supply grooves that index with the ends of the oil holes leading to the pin bearings. No shims are used in any of the full surface type bearings on the crankshaft. Oil is supplied by a gear pump located in the bottom of the pan in the plane of the center main bearing and driven by a vertical shaft and helical gear from an integral helical gear at the center of the middle bearing of the cam shaft.

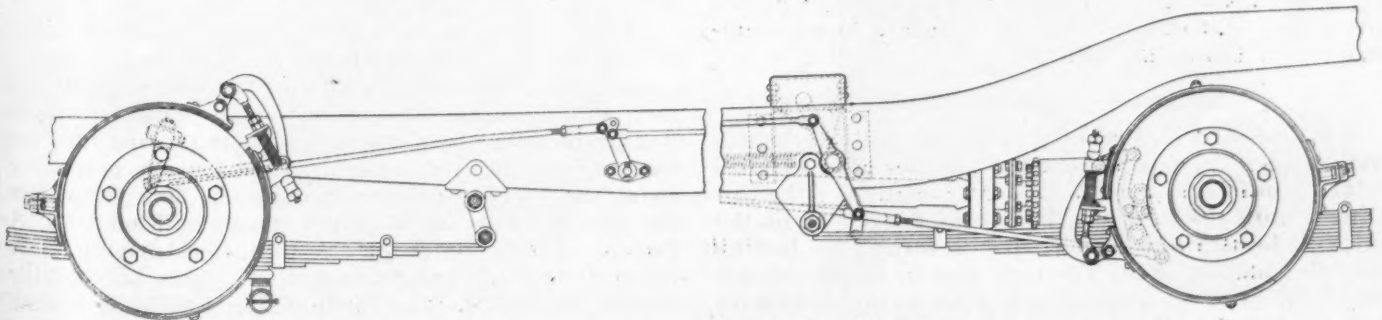
Pump Housing

A cast iron pump bracket, which is belted to the lower surface of the crankcase, carries a die-cast pump housing with a pressed steel cover inclosing a steel driver and cast iron driven pump gear. An inverted filtering screen is sweated into a pressed steel shroud which is clamped around the pump bracket flange. Copper tubes convey the oil to three main bearing caps, whence it flows through drilled holes in the crankcase webs to the cam shaft bearings and through the drilled crankshaft to the crankpin bearings, as already described. A nozzle discharges constantly on the silent chain wheel on the crankshaft and an adjustable pressure regulating valve is located at the front end on the left side. Tappets and cylinder walls are lubricated by the spray from the crankpin bearings.

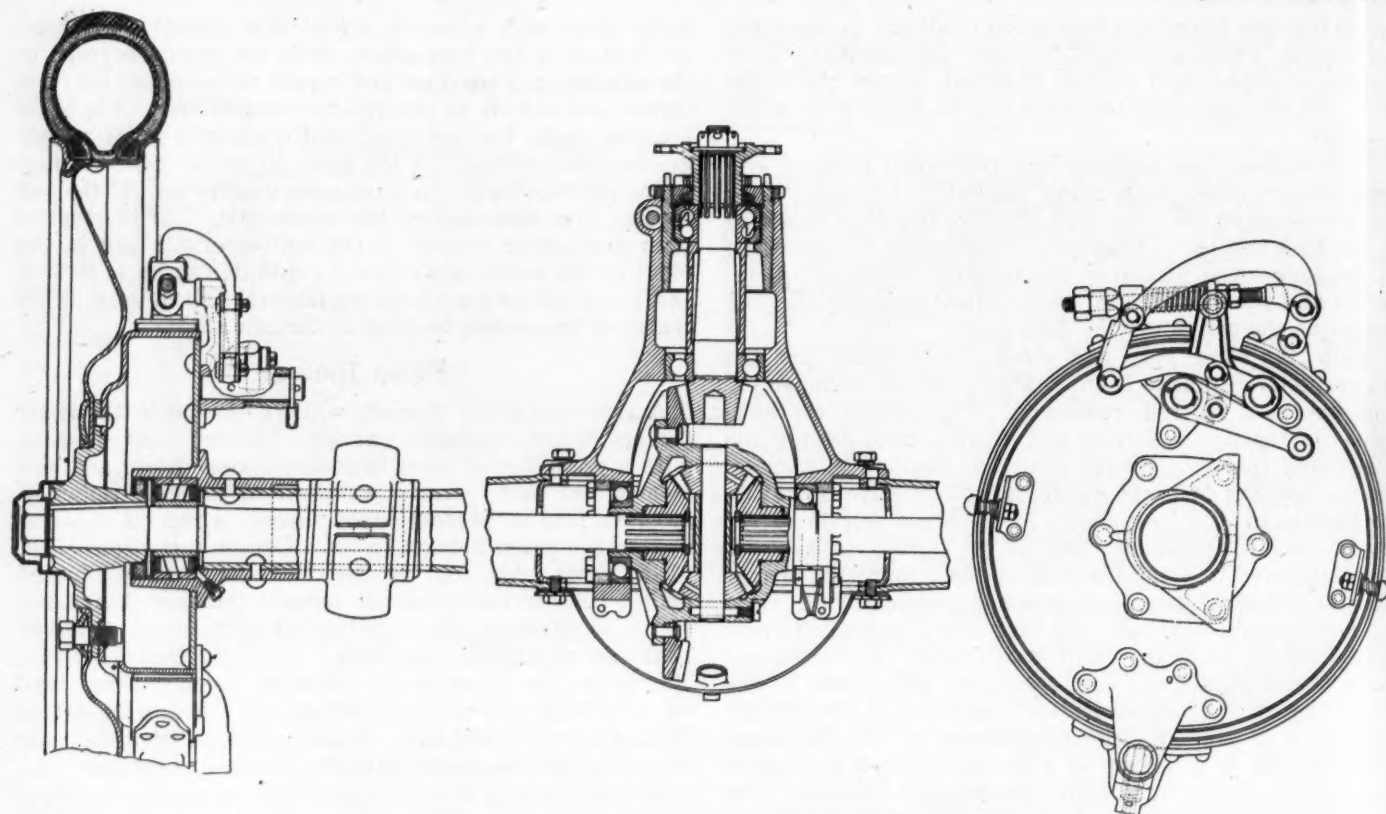
Connecting rods are of light I-beam section and measure 8 3/4 in. between centers. The lower caps are retained by two 3/8 in. dia. bolts. A full floating piston pin 3/4 in. dia. has its outer bearings in the light alloy piston and the inner in a bronze bushing of 1 1-16 in. length which is pressed into the upper end of the rod. Snap rings prevent excessive endwise travel of the piston pin. The piston is of the split skirt, constant clearance type having the skirt insulated from the heat of the head by sawed slots below the lowest ring. Two concentric rings 1/4 in. wide are located above a two-piece sealing ring of 3-16 in. width. Liberal water space is provided all around the valve seats and flame swept portion of the cylinder barrels, which latter are finished by the honing process.

As may be seen from the sectional views, the combustion chamber is located entirely within the head and is liberally water-jacketed. Spark plugs are located in recesses which are completely surrounded by water, approximately above the intake valves.

The valves, which lift 5-16 in., are of 1 1/4 in. clear diameter and are inclined at a 4 deg. angle. Both valves are of the integrally forged type, the intake being made of 3 1/2 per cent nickel and the exhaust of silerome steel. Cast iron valve stem guides which are 2 15-16 in. long and reamed to 5-16 in. inside dia. are pressed into the cylinder block. The springs are retained by the usual cup and C-clip and are 2 1/4 in. long when the valves are closed.



Diagrams of front and rear brake linkages. Compression of front springs due to application of brakes tends to ease pull on front brakes and thus prevent locking of front wheels



The semi-floating type rear axle with disk wheels

The mushroom tappets are of 9-16 in. dia. at the shank with a set screw adjustment at the upper end. Six of these tappets are carried in each of two cast iron brackets which are bolted on the cylinder mounting surface. The valve adjustment is inclosed by pressed steel covers seating on the cylinder casting and butting at the center on the tube around the distributor drive shaft.

The camshaft, which is 1 3-16 in. in dia. between bearings is carried on three pressed-in cast iron bushings, the dimensions of these bearings (diameter by length) being: Front, 1 15-16 in. by 2 3-16 in.; center, 1 7/8 in. by 2 1/8 in.; rear, 1 3/8 in. by 1 3/8 in. The oil pump and distributor drive gear is cut in the middle of the center bearing and is approximately 13/16 in. wide. End thrust of the camshaft is taken up on a steel plate between the silent chain wheel and the face of the front camshaft bearing. An assembled cast iron and pressed steel pulley, which is keyed on the camshaft at the front end, drives the fan and water pump through a 9/16 in. circular belt.

Water is circulated by an impeller mounted on the rear end of the fan shaft and projecting into the water jacket. A bronze bushing which is threaded for an external packing nut carries the impeller load. A second bronze bushing is located inside of the cast iron fan drive pulley. The fan spider is bolted to the pulley which in turn is pinned and keyed to the shaft. These two units are driven at approximately crankshaft speed.

Stromberg Carbureter Used

A Stromberg 1 in. Model OE carbureter with accelerator well supplies the mixture through the two-piece external intake manifold, a short vertical pipe connecting the carbureter with the heating chamber at the center of the inverted branch pipe. A hot spot is formed by bolting the inner portion of the T-branch directly to the exhaust manifold. The inverted branch pipes swing downward and are bolted to the fore and aft distributing manifold of square section. Siamesed ports are provided for cylinders 1 and 2, and cylinders 5 and 6, respectively, and

individual ports supply cylinders 3 and 4. The edges of the intersecting passages are relatively sharp and the square section is blended into circular sections at the ports. This arrangement is said to tend to prevent deposition in the manifold and, therefore, to insure good distribution of a well-prepared mixture.

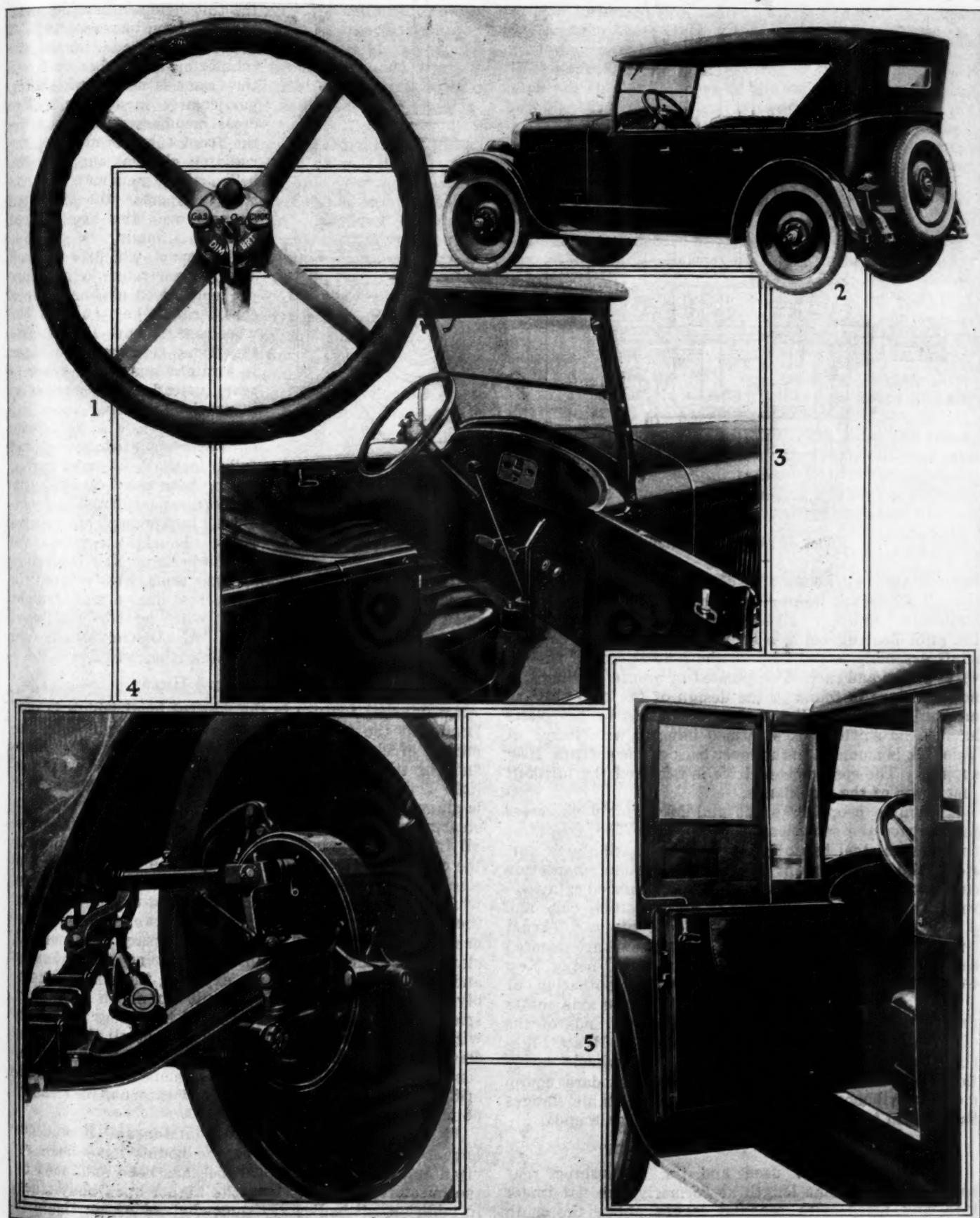
Remy Electrical System Used

The electrical system throughout is of Remy manufacture, the full automatic advance distributor being placed above the cylinder head and driven by an upward extension of the oil pump drive shaft, which is inclosed in a steel tube. The thermostatically controlled generator is driven through the silent chain triangular front end drive, at one and one-half times crankshaft speed. Adjustment of chain tension is effected by tilting the generator mounting pad about the lower belt of the three-point flange. The starting motor is mounted back of the clutch bell housing below the horizontal center line of the crankshaft on the left side. A pressed steel bracket supports the high tension ignition coil near the top of the block at the right side of the engine, just across from the distributor head. Short high tension leads connect the distributor head with the S. A. E. standard spark plugs.

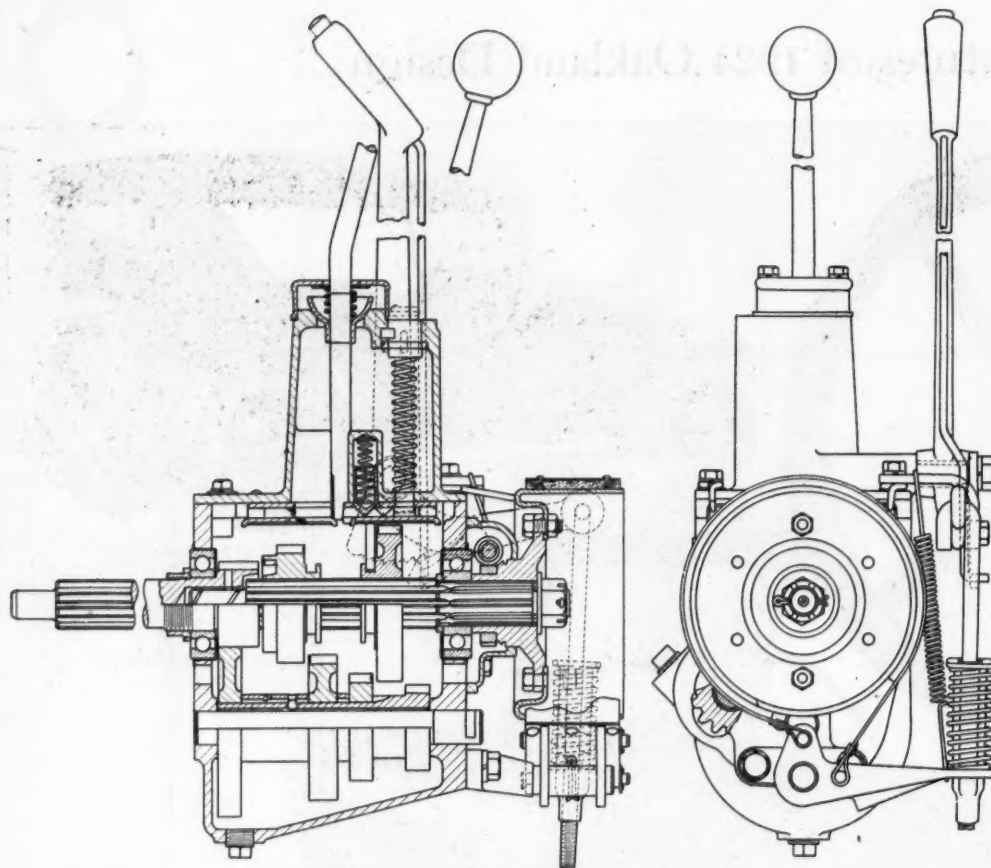
An open type Hoosier 9-in. clutch transmits the power to the gear box. The clutch and flywheel are inclosed in a cast iron bell housing forming the rear engine support, with a pressed steel lower section. The clutch pilot is a graphite-bronze bushing which is pressed into the rear end of the crankshaft. An extension projecting above the floor boards terminates in a Zerk fitting for the lubrication of the clutch throwout ball bearing. A feature of this clutch is the thin steel driving plate which carries the two friction discs. This bell housing carries the pedals. The third engine support is located under the starting crank jaw barrel of the gear case cover and consists of a two-belt pad.

The gear box, which is centered on and bolted to the

Features of 1924 Oakland Design



1—Control mechanisms have been placed on steering wheel. 2—New Oakland phaeton has trim lines. 3—A close-up of the driver's compartment. 4—Detail view of front wheel brake construction. 5—Special effort has been made to make the open body adaptable to various kinds of weather



Views of the gearset showing novel shifting mechanism

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A tubular propeller shaft and Mechanic's universal joints drive the semi-floating rear axle. The axle is of the pressed steel banjo type, with a malleable gear carrier bolted to the front and a pressed steel inspection cover at the back. The pinion shaft is carried in a two-row annular bearing mounted in an adjustable cage and a single row bearing adjacent to the pinion. Thrust type bearings with individual adjustment are located each side of the bevel gear differential, all being New Departure bearings. A spiral bevel combination of 4 7/10 ratio is standard equipment. The live axle shafts are retained by split washers at the inner ends of the differential gear hubs and are carried in Hyatt high-duty bearings at the wheels. Disk steel wheels carrying 31 x 4 cord tires, which are now standard equipment on all models, are centered on malleable flanges that are in turn mounted on the tapered axle ends.

Rear Springs Are Underslung

Hotchkiss drive is used and the underslung rear springs, of the same length as formerly, are flat under load and fitted with rebound leaves above the main plates. The front springs, although of the same length as formerly, have been reinforced for operation with the front wheel brakes and are flat under load. Steel

jacketed bronze bushings are used in all spring eyes. The depth of the frame has been reduced from 6 1/2 to 5 in. and the thickness of the side members has been increased to 5/32 in. With the addition of the tubular cross member in front, the frame is now much stiffer, particularly in torsion. Five cross members are formed by the front tubular member, the radiator channel support, the bellhousing member and its steel supports, the inverted channel over the brake cross shaft and finally, the gasoline tank support, which is a broad steel plate riveted to both upper and lower channels for a considerable length. The wheelbase is now 113 in. and the frame side members taper in straight lines from front to rear, instead of being offset as in previous models.

The front axle is an I-beam with over-mounted springs and fully inclosed steering pivot, having been reinforced to carry the stresses incidental to front-wheel braking. The reverse Elliot knuckle carries the front wheels on New Departure

thrust type bearings. Steering arms are secured in tapered holes and both drag and cross links are of straight one-piece tubular construction with leather-lined steel protectors at the ball joints. All Distel wheels are secured to hub flanges by clamping rings and five bolts.

Unusual Control Head

An unusual feature is the control head which is now located at the top of the Jacox steering gear. An aluminum bracket carries the horn button, telescopic choke and throttle buttons on square shanks, a three position light switch and, lastly, the ignition switch. This bracket is clamped to a steel tube which extends up through the steering column and contains the various electric wires, all in a loom conduit, and the two steel wires forming the choke and throttle controls. At the lower end of the steel tube these steel wires are extended into tubes which carry them around the front end of the engine to the carburetor. To inspect electrical connections underneath the central head, it is only necessary to loosen the clamp belt at the bottom of the steering gear housing and push the entire tube up, exposing the entire assembly. The steering wheel is built up of an aluminum spider and a wood rim. The control head does not rotate with the wheel but remains stationary at all times. The steering gear is lubricated by a Zerk oil gun at a special connection. This lubricating equipment has been standardized throughout the chassis and external lubrication points of the engine.

Although the characteristic radiator and hood lines have been retained, all types of bodies have been revised and improved. Appearance has been enhanced by the lower frame height and the higher open body sides. In addition, all bodies are somewhat wider, particularly at the cowl and in the front compartment. The rear corner line of the open five-passenger models has been rounded, and outside door handles have been added.

Particular attention has been given to weatherproof inclosure of all open models. Permanent tops are now standard equipment throughout. These tops are fitted with a substantial weather strip below and inside of the lower edge of the permanent frame. Curtains are mounted on steel frames so that they fit to this weather strip in a neat, flush manner. The quarter curtains at the windshield are now clipped tightly around the side frames by steel springs. Rubber weather strips are placed between the two windshield panels and between the panels and the side frames.

As an alternative for the standard curtains, a glass panel inclosure is available as an extra for all open models. These panels convert the open car into a very satisfactory closed car and can be installed in practically the same time as a set of curtains. Windows in the inclosure are adjustable and the rear panels may be swung open for ventilation. The cost of this equipment is \$60 for the five-passenger and \$40 for the roadster bodies. This form of inclosure gives the owner his choice of the type of car for different weather conditions.

All open cars are finished by an enameling process which forms a durable lustrous finish. The sport models have a top of khaki material and include as standard equipment front and rear bumpers, rear view mirror, moto-meter with bar cap, visor, windshield wings, kick plates and corrugated rubber covers on the running boards. Sport models are upholstered in blue figured leather and the standard open models in black leather.

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Although many refinements have been made and front-wheel brakes added, prices on the complete line are lower than on the preceding model. In addition to bringing out the new model, Oakland has installed practically an entirely new production equipment of the most modern kind.

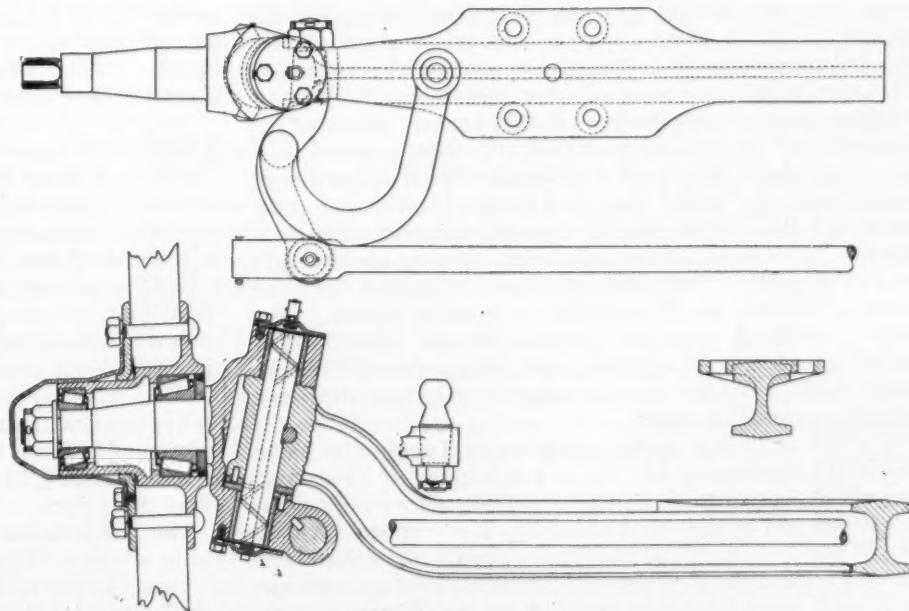
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A "MODEL 600" front axle has been developed by the Continental Axle Co. particularly to meet the demand for an axle for 18-25 passenger motorbuses, though the same axle is also recommended by the makers for 2-2½-ton trucks. The axle is of the reversed Elliott type, as required for most systems of front wheel brakes, and in this connection it is of interest to learn that the manufacturers will shortly announce the details of a brake which can be built into this axle. Center point steering is used, and the spring pads are dropped either 3 or 5 in. with respect to the wheel axis. The axle can be built for a range of tread widths from 58 to 68½ in. It has a standard S. A. E. No. 6 wheel spindle and bearing layout, lubrication of the knuckle pin and parts is by the reservoir system, and ball type connectors are employed for the tie rod.

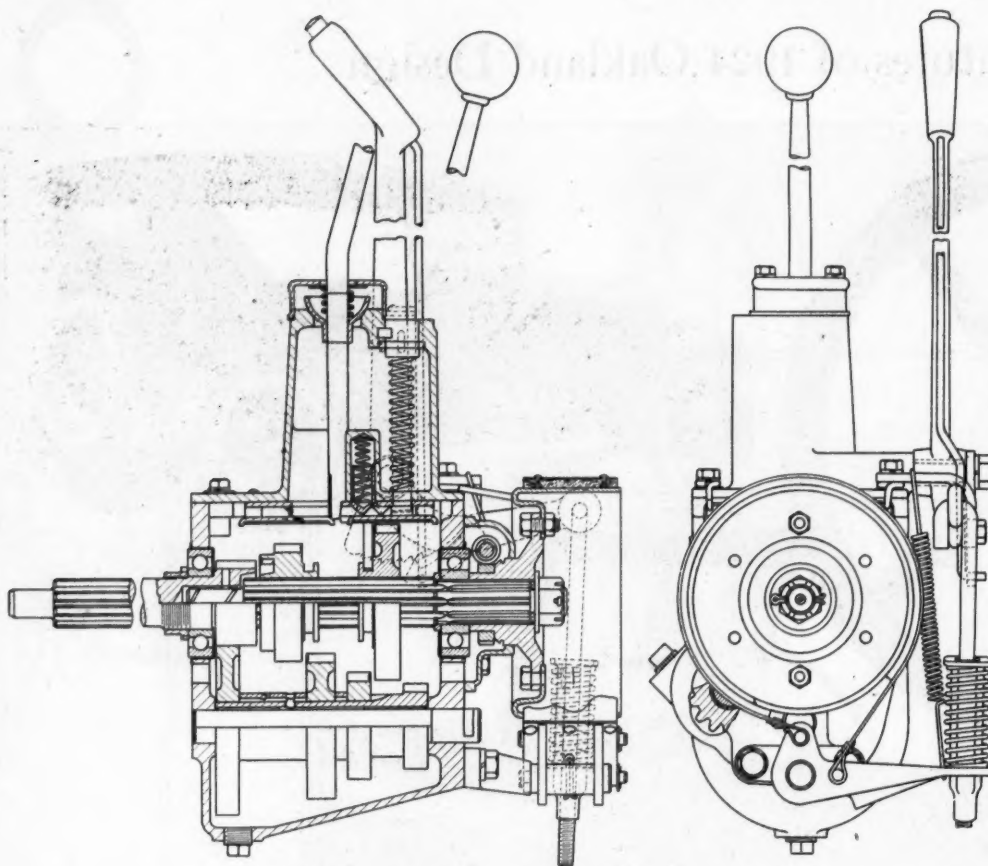
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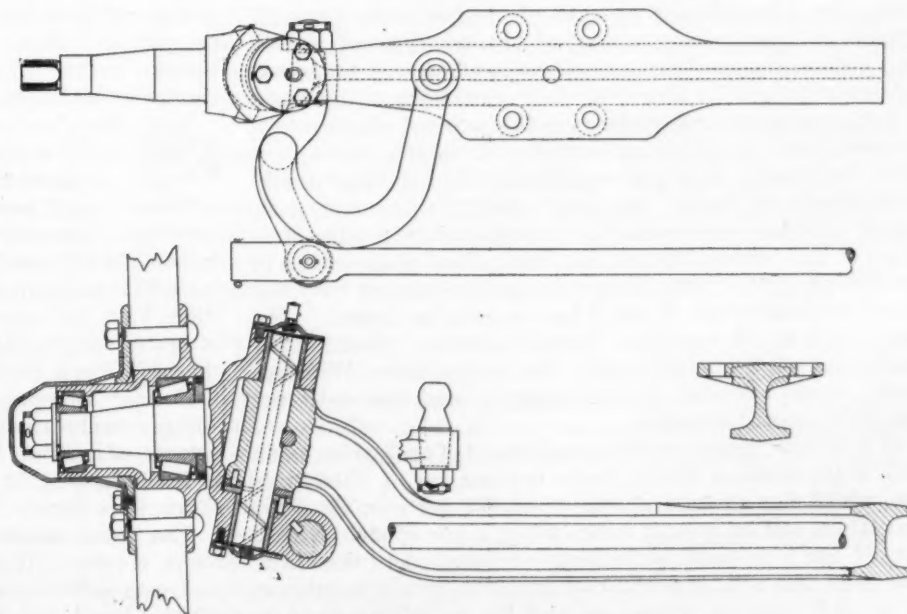
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Continental Model 600 motorbus front axle

Publicity Must Have Real News Value to Be Successful

Recent bulletin of American Newspaper Publishers Association criticises automotive statements. Publications seek material of actual interest to readers, but consign space-grabbing efforts to waste-basket. Advertising does not control editorial space.

By James Dalton

CONSIDERABLE space is devoted to the automotive industry in a caustic bulletin on "free publicity" recently issued by the American Newspaper Publishers Association. After reading it, one can scarcely refrain from feeling that the publishers are peevish. Furthermore, they have reason to be.

"A week's supply of free advertising received by a member has been forwarded to this office," says the bulletin. "It should have been preserved as a horrible example in our museum of space grabbing schemes. Instead we have tabulated and print below a list of the automobiles alone represented in the one collection.

"Tire, spark plug and parts manufacturers in profusion and two associations complete the list of the industry's representatives who sought free advertising in that one week.

"What are you going to do about it?"

Then follows a list of FIFTY automobile manufacturers whose publicity men have attempted to get something into the papers! We haven't seen all this material but we have seen a substantial fraction of it and on this basis we venture the assertion that 99 per cent of it was absolutely devoid of news interest to anyone. It was patently an effort to get the name of the company or its product into the news columns.

THERE has been of late a gratifying improvement in the quality of automotive advertising but unfortunately the same cannot be said of its publicity. It still belongs to that ancient school of theatrical press agents who depended upon "lost jewels" or some equally transparent device to get the names of their clients into the papers.

Self-respecting newspapers of the present day are interested only in one thing—news. If there's news in a story they don't begrudge a little incidental advertising. Propaganda or "bunk" designed solely to promote individual or collective interests isn't news, not even when it is disguised as human interest material. Papers are eager to get human interest into their columns but it must have the stamp of honesty and it must have a genuine appeal. The same is true of so-called "freak" stories. The mental ramblings of the imaginative gentleman from Winsted, Conn., would not come in this category, and that date line seldom appears nowadays.

If a farmer living on the outskirts of Turnipville hauls coal in the tonneau of his Beetle touring car of 1910 vintage, which has covered a total of 48,973 miles in its peregrinations and he doesn't want to buy a new model because the old one is so good, he is acutely interested in that fact. The man who sells him the coal probably gets a laugh out of it each time he drives up and his neighbors may be mildly amused, but of what earthly interest is it to

newspaper readers in general throughout the country?

And yet that is one of the types of stories sent out by automotive publicity men. Is it any wonder that newspaper editors have to use hampers for waste baskets and that they are almost submerged each day in the overflow?

THERE are two schools of press agents. One of them operates on the theory that he is entitled to a certain amount of free space because his company, or its dealers, buy a certain amount of space in the papers which are his targets. It would be quite as logical to expect the manufacturer of an automobile to supply each purchaser with a spare engine. Most publications lose money on their circulation and they have nothing to sell except their advertising space. Why should they give it away except to promote the public good. Promoting the sale of motor vehicles generally is for the public good and newspapers don't object to doing it when the promotion material contains news, but from their point of view there is a vast difference between an industry as a whole and its component parts.

Press agents in the other school spend their lives, consciously or unconsciously, in trying to "put something over" on the editors to whom they send their effusions. Putting something over on an editor may be, to their minds, a highly commendable object in life, but it's a tough job. Editors as a whole, especially city editors and news editors, are rather hard boiled persons. A considerable portion of their time is spent in seeing to it that things are not put over either on them or their reporters. They have become rather adept at it. Perhaps that's what makes them the best publicity men.

EDITORS have ample reason for becoming somewhat cynical about the professed altruistic purposes of persons who send them stuff to print. It is to their everlasting credit, therefore, that they patiently wade through the mass of chaff which comes to their desks every day in the hope that somewhere in it they may find a grain of news. They have an unerring instinct for extracting the kernel of news from the adjectives in which it is imbedded. When they can dig it out they print it.

Neither newspaper publishers nor editors have any special grievance against automotive publicity except that the volume of it is so large that a good deal of valuable time is spent looking it over in the never ending search for a stray news item.

The great mass of automotive publicity can make no claim whatever to originality. It follows hackneyed lines and gets nowhere save perhaps on the "automobile page" which almost nobody reads except the proofreader who is paid for doing it. There has been some improvement in

these pages in the last two years but not much. It's a pity, too, for they might be made interesting and popular. Even a confirmed motorist will do little more than scan the head lines.

Broadly speaking, the editors of newspapers and other periodicals divide the people of the world into two classes. In one class are those who want to give them what they don't want and in the other are those who don't want to give them what they do want.

SOMETHING which happened last month and which is known by everybody who is really interested in it, even though it may not have been published, is not news. That is one kind of material which the publicity man is most prolific in sending out. He releases it at the time his employer thinks will best serve his purpose. The employer is entirely justified in thinking first of his own interests but it is not logical for him to be incensed at the publication which wanted the information when it was fresh but has absolutely no interest in it when the news element has been lost.

No mysterious formula is necessary to get news into print. We know publicity men for two very large automobile corporations whose scrap books are filled with clippings of the stories they have sent out. They are not specially favored and few of the editors to whom their material goes ever heard their names. Both are former newspaper men. When they went into the publicity business they resolved firmly never to ask publication of an item which did not contain actual, legitimate news.

They put themselves in the place of the editor who will get it and determine whether or not they themselves would publish the information if they were on the desk in a newspaper office. If they decide they wouldn't they don't send it out. They use neither adjectives nor superlatives. They stick to facts and let the facts tell the story. They know before they send out such a story that a very large percentage of the papers to which it goes will print it.

HERE is a lesson for the other publicity men in the automotive field. If they will confine their offerings to actual news they will have no trouble whatever in "putting it over." Newspapers know that a very large percentage of their readers are motorists and that they are interested in automobile news. They want to get it but it must be NEWS and it must contain actual reader interest. If it does they are not concerned about the incidental free advertising it may carry.

Incidentally, neither advertising nor publicity is effective if it is filled with obvious exaggerations and unwarranted superlatives.

Another fault of a good many press agents is that they seem to think they are doing a favor to the publications on their mailing list by sending them their stuff. Apparently they think newspapers and other periodicals always are short of material to fill their columns and will welcome any collection of words which will fill space.

Any such notion is wholly mistaken. There isn't a newspaper of any size in the country which doesn't leave out each day, because of space limitations, more legitimate

news than it prints. Each issue is the result of a careful process of elimination and selection. You seldom are doing a favor to the other chap by asking him to do something which will help you and won't help him. When you give a publication something in which a large fraction of its readers will be interested and publication of which will help you, it's a 50-50 process but on the other basis the percentage is 100-0.

THE bulletin of the Newspaper Publishers Association, previously mentioned, cites the case of a parts company which sent to the newspapers a letter in which it said:

"We have no accurate way of knowing whether you are able to use any or all of this publicity we send to you and therefore we are taking the liberty of asking you to let us know whether you care to have us continue sending these articles. * * *

"We are not asking this favor of you with any idea of cutting down our publicity list; in fact we wish to enlarge it. But if, by any chance, our publicity articles are being consigned to your waste basket without a chance of publication, it is only fair to us that we should know about it. * * *

"If you find time to write us on this matter, perhaps you can also give us a general or specific idea as to just what sort of publicity meets with your editorial policy."

All of which brings the comment in the bulletin that it offers an excellent opportunity to go firmly on record to the effect that no "sort of publicity meets with your editorial policy." There's a world of difference between publicity and news.

This is not an isolated case. The number of automotive companies which send out these covert threats

to deprive publications of their publicity material, most of which cannot possibly be of value to anyone except themselves, is really surprising.

The same bulletin also refers to an oil company which sent to newspapers a circular letter saying:

"In connection with our campaign now running in your paper, we would very much appreciate your running the attached news item in your Sunday automobile section, sending us copy of same."

If the "news item" had contained news no request would have been necessary to insure its publication.

If the publisher of that paper had invested in oil the same amount that the oil company spent with him for advertising and then asked for a few extra cans because of this purchase, he would have been classed as a lunatic or told the oil company wasn't in business for its health.

THEN there's the request for a marked copy. That is peculiarly irritating. Why doesn't the publicity department subscribe to a clipping service? Mightily few publishers employ clerks to send out marked copies and marked copies cost just as much money as those which go to paid subscribers.

Publicity men who seek only to get free advertising for the products they represent are not dangerous propagandists but they are injuring industry as well as their employers by their poor judgment and their apparently erroneous conception of the honest purposes of the publications to which their material is sent.

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Self-respecting newspapers of the present day are interested in only one thing—NEWS. If there's a story in it they don't begrudge a little incidental advertising.

News is news and advertising is advertising. It is advertising revenue which makes it possible to publish newspapers. Advertising is most valuable in papers which are successful and widely read because they give a complete, fair, unbiased picture of world events every day. They would be unable to perform this service if their columns were laden with "publicity" sent out by the myriads of interests which are continually seeking its publication.

THERE was a day when advertisers were able to control the columns of many newspapers but that day is rapidly passing if it is not already past. Such venal publications found they could not long fool the public and their circulation melted away. Advertisers found that, regardless of all moral considerations, the size and character of circulation attained by such papers made the money spent for advertising in them practically a total loss. Thereafter they bought space in papers conducted on honest business principles in which they were given value received.

Advertising space is just as much an honest commodity as automobiles or anything else. There is no earthly reason why the producers of that space should be expected to give it away as they do when they publish "publicity" which has no news or information value. They are simply pulling somebody's chestnuts out of the fire at no profit to themselves.

A good many advertisers still seem to feel, however, that "publicity" or "puffs" in the news columns are perquisites which should go with an advertising contract and that they are entitled to them. Letters something like the following are not uncommon in editorial sanctuaries:

"We (or our clients) have been advertising in your columns for three months (or three weeks) and have not yet had a single write-up. What do you propose to do about it?"

Unless the advertising contract was signed and accepted with the distinct understanding that it entitled the advertiser to a stated amount of editorial space, there is no justification whatever for expecting "write-ups" as a gift. If it were given on such a basis the chances are ten to one that the character of the circulation is such that the copy will have mighty little selling power.

Suppose an automobile was sold on a contract basis and that the purchaser paid the first installment after he had used the car a month, what would the maker think if he received a letter saying:

"I have been using your car a month and I have not yet received from you gratuitously a single part or accessory. What do you propose to do about it?"

WHEN an advertiser places a contract with a newspaper, expecting to get full value received because of the character or volume of the circulation of that paper, he has no inalienable right to free publicity or "write-ups." What is true of a newspaper is true of any other publication which stands or falls on its merits. Advertisers don't expect "write-ups" in the so-called "national" publications and they don't get them.

Not all publicity seekers, or even a majority of them, are advertisers, however. Many of them are simply propagandists, paid well for their services, who are trying to get some message to the public by using the publisher as a medium. Here again the publisher is broad-minded. If their propaganda contains legitimate news, or if it is designed actually to serve the public or any large part of the public, he will gladly publish it. The fact that he gets no revenue from it makes no difference to him. He feels a

deep obligation to serve his readers and he does serve them to the best of his ability.

THE American public has been thoroughly sold on the motor vehicle. Some of this selling has been the result of advertising, a little of it has been the result of publicity, but most of it has been because of the inherent desire of every normal being for individual transportation. The public is intensely interested in motor vehicles and it reads avidly actual news about the cars themselves, engineering and mechanical developments, new models, real news of the factories, the companies and the personnel. But avid as is public interest in automobiles, people are not going to read columns of "publicity" which tell them nothing new. When a publicity man does succeed in putting something of that sort over he defeats his own ends.

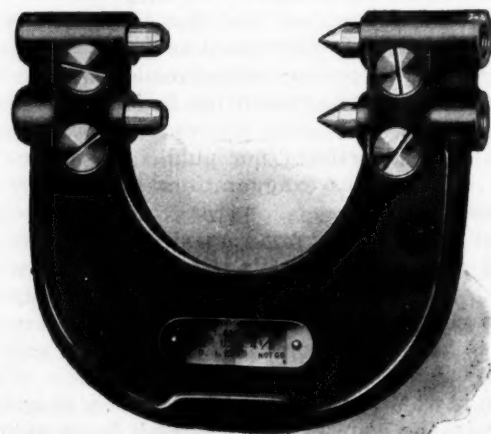
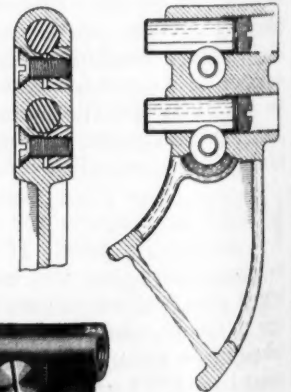
If the publicity men of the automotive industry will devote most of their time to the dissemination of actual news and real information about their products, they will get a greater amount of space in the publications they want to reach, they will create good-will on the part of publishers and they will promote the best interests of the motor vehicle building industry.

New Greenfield Snap Gage

DEFFECTS usually found in snap gages are claimed to have been eliminated in a new gage of this type which has been put out by the Greenfield Tap and Die Corp. The drawing herewith shows the method of locking and adjusting. The bearing of the individual locking bushings is on a flat on the anvils, so that the bushings are securely held from turning, thus maintaining the alignment of the gaging faces.

Rigidity is essential to proper gaging, and with this in mind a reinforcing flange has been added to the outer edge of the frame. In addition to stiffening the frame, this flange helps the "feel" of the gage in the hand, particularly if gage and hands become slippery with oil. Provision is made for holding the gage in a stand when this adds to the convenience or speed of gaging.

A feature of this line of gages is the wide range of adjustment in each size. This permits of covering a given range of sizes with fewer gages, which means a saving on gages for special work or small production jobs, where it is frequently possible to reset from one size to another.



Education of Dealers Along Business Lines Will Increase Use of Garage Tools

Repairshop men are more interested in making money than in saving time. Many of them do not know how to charge properly for jobs performed with machine equipment. Overhead neglected.

BETTER service depends largely on the increased use of garage tools. More widespread use of such equipment, in turn, will be determined by how much dealers and repairshop men make out of the machines which they have purchased already. The service station is interested primarily in showing a profit. It is interested in saving time only in so far as time saved can be translated into financial gain.

These rather obvious facts have not been sufficiently recognized in the past, despite the very excellent educational work along mechanical lines that has been done among garagemen both by shop equipment manufacturers and car makers. Emphasis has been laid on the mechanical side of using garage tools, while the business side has been somewhat neglected. This condition is reflected in arguments the machine tool salesman is confronted with in some instances.

Perhaps the salesman has explained very thoroughly to the service station owner the technical features of the product and has demonstrated how it can perform many jobs in half the time required by hand methods. The dealer may be impressed with the truth of the statements and with the efficiency of the machine.

"But," he is likely to say, "why should I buy the tool anyhow? Suppose it does do the job in half the time. I get half as much for it and my profits are the same. Why, as a matter of fact, here is a reboring tool I bought about a year ago. I have had it in use constantly ever since. But so far as I can determine I've been losing money on the jobs rather than making more. Time may be money, but it hasn't worked out that way for me."

Obvious Answer Available

There is an obvious answer to this kind of reasoning, but it is not always given. Perhaps the salesman has not thought of the problem before in just this light.

The trouble lies in the fact that the dealer who has been in the habit of charging on a time basis continues to do so after he has installed a machine tool. If he did a job in two hours without the equipment and in one hour with it, he cuts his price in half. He fails to take into consideration the increased overhead cost involved in owning tools.

Frequently he hasn't any cost keeping system; perhaps not even a good set of books which will tell him just how much it costs to do business and what parts of his efforts are really yielding profits.

The result is that many dealers fail to get the most good out of tool equipment. This makes them hesitate to buy more and tends to discourage their neighbors from making similar investments. Such a condition is particularly unfortunate, because it is caused simply by neglect of ordinary commonsense business principles.

The trouble can be corrected, however, by concerted effort on the part of shop equipment manufacturers, who are the persons most interested. Car and truck

builders also can play an important role in correcting a condition which hinders maximum service efficiency.

Each garage tool maker might well work out in detail a statement of how the dealer and garage man can make greater profits by the use of his particular product. This statement would tell how to charge for jobs done on the machine, how to keep the machine busy throughout the year, and how to keep proper cost records on all work.

Having developed this business education material the equipment manufacturer can tell the story to dealers and jobbers in various ways. Advertising literature, catalogs, trade paper campaigns and jobber salesmen can all be used to preach the gospel of "how the dealer can make a profit by using this equipment."

Detailed Story Necessary

It is not enough to tell the garage man that he can add to his income by buying a particular tool. The story must be a detailed, practical one, which will include information as to how this desirable result can be achieved.

The vehicle manufacturer comes into the picture through his service department. Flat rate schedules have been developed by many car builders. When such schedules are worked out to include money charges as well as operation times, the dealer has been supplied automatically with a sound basis upon which to charge for certain machine tool jobs. This work can be carried further in the future and applied to a wider range of work.

Service bulletins and factory traveling men can also help to educate the dealer in proper cost and bookkeeping methods. Efforts of the car manufacturer along this line might be broadened to include a wider range of commercial and business education. The dealer with a proper accounting system for all of his work will very likely charge properly for repair jobs and change his methods of charging when tool equipment is installed.

Increased Sales Possible

Results from work of this kind cannot be expected in a few months, but continued efforts are certain to be worth while. Just as considerable educational work along mechanical lines was necessary before concrete benefits were derived, so commercial education will have to be carried on effectively for some time. Material progress can be made within twelve months, however, if all of the interested manufacturers put their shoulders to the wheel and help the cause along.

Activities of this kind will aid materially to increase the sale of shop equipment and garage tools, will make service stations pay profits, and will go far toward stabilizing the financial condition of dealers and garage men throughout the country.

Navy's New Dirigible, ZR-1, Completes Trial Flight Successfully

Largest American built airship resembles the German Zeppelins. Measures 680 ft. in length and 78 ft. in diameter and carries crew of 31 men. Cruising radius is 4,000 miles. Trip to Pole is contemplated. Is powered with six 300 hp. special Packard engines.

By Herbert Chase

THE big American-built dirigible, ZR-1, came through its first test flight with flying colors. It went into the air for the first time on Sept. 4 and returned safely to its hangar at Lakehurst, N. J., after a cruise which lasted more than an hour.

This article attempts to picture the great ship in such a way as to give the general executive and automotive engineer a clear idea of what the ZR-1 looks like and how it is built.

IN general type and appearance, as well as in many features of construction, the ZR-1 resembles the German Zeppelins. It measures 680 ft. in length, so that if stood on end it would be some 25 per cent higher than the Washington monument. The greatest diameter of the ship is 78 ft. and the overall height from the bottom of the forward car to the topmost point of the hull is 93 ft. The total weight is about 75,000 lb. and the cubic capacity approximately 2,150,000 cu. ft.

It is manned by a crew of 9 officers and 22 men and is designed to have a cruising radius of 4000 miles. After thorough tests it is planned to sail the ship to the North Pole and return. A sister ship, designed by and for the United States Navy and to be known as the ZR-3, is nearing completion in Germany and will probably be flown to this country by a German and American crew some time in November.

Picture, if you will, a gigantic and very much elongated bird cage, laid on its side and with rather pointed ends, giving a cigar-shaped contour. In place of the wires forming the longitudinal members of the cage and the rings which hold them together, substitute lattice work girders built up from strips of duralumin pressed into V-shape and assembled to form a triangular structure measuring about 1 ft. on each side and tied together by bracing forming triangles between lattices. Then you will have a clear picture of the frame of the ship.

Twenty-five Longitudinal Girders

There are 25 of the longitudinal girders and 20 main rings which, instead of being true circles, are 24-sided polygons. Each of the rings is braced with transverse wires, running from corner to corner of the polygon and dividing the ship into 20 compartments, each of which contains a gas bag which substantially fills the space bounded by the rings at each end and the longitudinal girders on the circumference. Between each of the main rings is a secondary ring attached to the longitudinal members but having no cross wires.

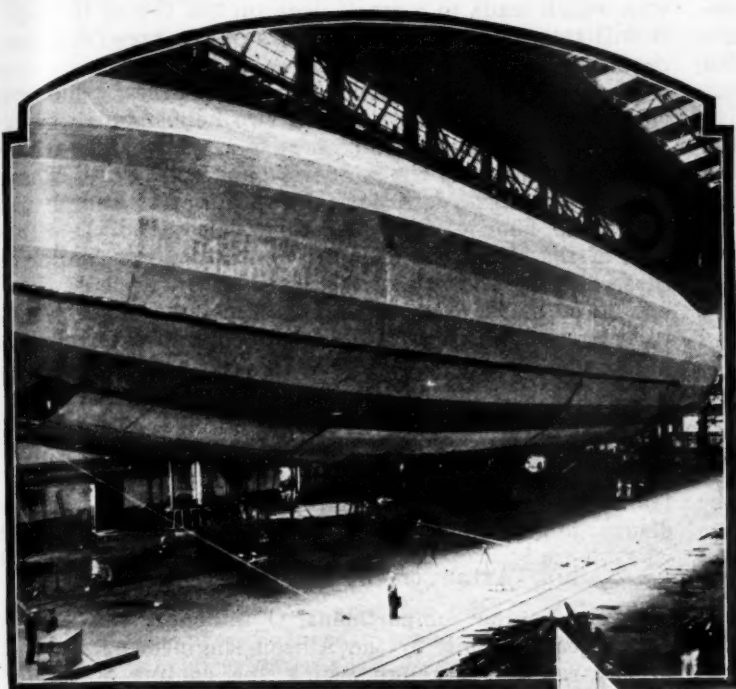
It will be noted that the circumference of the frame is divided into oblong spaces. From opposite corners of each oblong are stretched steel cables, which help hold the frame in shape and give longitudinal stability to the frame as a whole. The end sections of the frame are conical instead of having the approximately cylindrical form of the central sections. The assembly thus has a contour similar to that of a cigar.

Additional Frame Member

Running from end to end of the framework inside the rings is an additional longitudinal member spaced some 10 ft. from the bottom of the ship. This is supported by girders arranged in the form of inverted Vs at each ring, the whole forming what is termed the keel of the ship. The V struts, together with the bottom members of the polygons, form a triangular passageway through which the crew can pass from one end of the ship to the other and, by the use of suitable ladders, enter the cars or gondolas which are suspended below the frame and carry the power units.

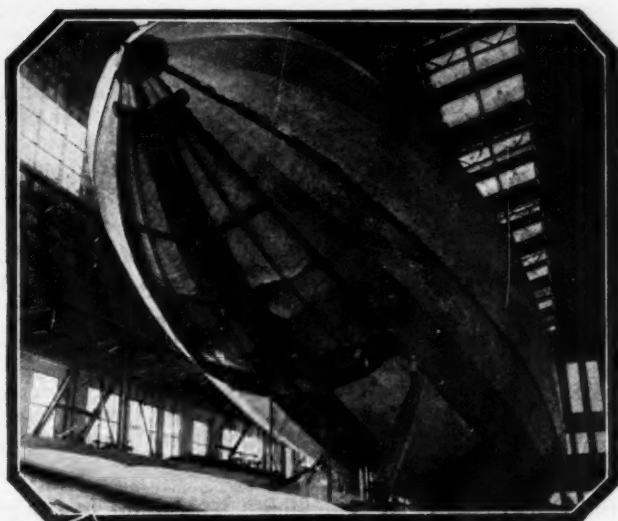
Each of the spaces between the longitudinals of the framework is filled in by a strip of rather light-weight cotton fabric, which is laced at the edges to the metal frames formed by the longitudinal girders and the sides of the polygons. The space between these strips is then covered by narrow bands of fabric, which are pasted in place to cover all openings. Thus, substantially the entire surface of the ship is made into one piece, which is, however, entirely separate from the gas bags.

The fabric is covered with an aluminum paint or acetate dope on its outer surface and is made black on its inner surface in order to diffuse light and heat rays which would otherwise cause considerable changes in the temperature and consequent pressure of the gas in the inner bags. The outer coating of aluminum dope is said to reflect about 75 per cent of the sun's rays which strike it, while the black undercoating diffuses the remainder.

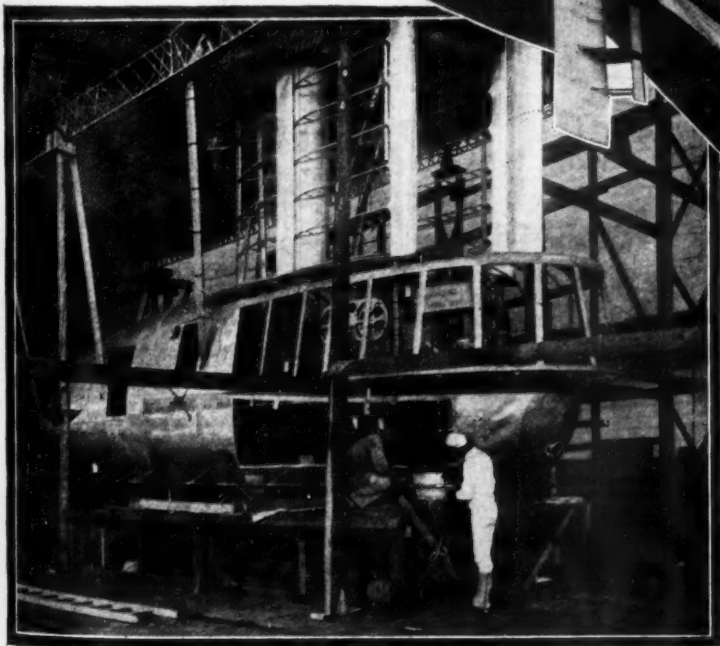


Right—Tail of ZR-1 showing control surfaces: the vertical rudder for changing the course of the ship and the horizontal elevator for directing the ship in upward and downward flight. (Kadel & Herbert news photo)

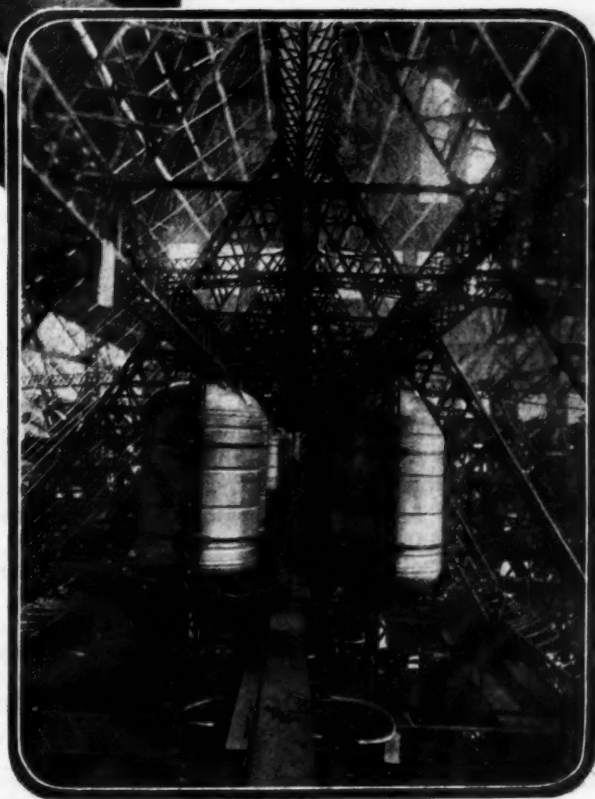
Left—A close-up view of the ZR-1 looking aft from a point near the bow. The forward or control car is seen in the foreground and the other cars further aft. (Underwood & Underwood photo)



Above—Bow and keel of ZR-1 showing several of the gas bags in place. Underside of frame is about to receive its outer covering. A cable passing from a winch inside the frame through the fitting on the forward end will be used to fasten the ship to mooring masts. (Kadel & Herbert news photo)

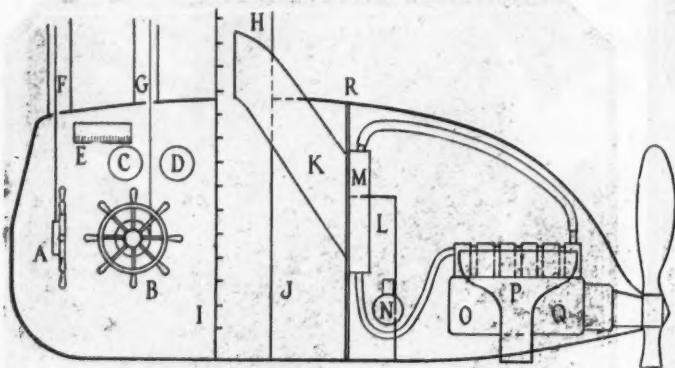


Control compartment in process of construction. The after portion of this compartment contains one of the six 300-hp. Packard engines which propel the ship. The window near the center of the compartment opens into the radio room. Just forward of this is a ladder leading through a vertical passageway to the interior of the hull. (Wide World photo)



Right—View along keel passageway of the ZR-1. Triangular latticed duralumin girders used throughout the framework of the ship are clearly seen. Several of the 113-gal. fuel tanks and their supports are shown. (Wide World photo)

Inside the outer fabric covering, attached to the framework of the ship, is a very coarse mesh network of cotton cords, which keeps the gas bags from contact with the outer covering and also prevents them from expanding into the triangular passage forming the keel. Inside of this network are the 20 gas-tight bags which hold helium, a rare but very light non-inflammable gas which renders the ship as a whole lighter than the atmosphere



Diagrammatic sketch indicating the approximate arrangement of the control compartment and forward engine compartment

and thus gives it its buoyancy. The inner gas bags are formed of a light cotton fabric, to the inner surface of which are rubber-cemented gold beaters skins, calculated to help to render the bags gas-tight.

Parts thus far described form the major elements of the hull of the ship. From this are suspended six cars, in each of which is located a 300-hp. 6-cylinder Packard engine, designed to run at a maximum speed of 1400 r.p.m. The forward and rear cars are suspended directly below the axis of the ship and each is fitted with a 12-ft. propeller geared down to run at 556 r.p.m. The other four cars are suspended below, but near the outer limits of the hull, two on the starboard and two on the port side. Of these four, one pair is fitted with propellers designed to run at engine speed, while the other pair are equipped with a gearset which enables them to run either forward or reverse at a maximum speed of 556 r.p.m. The two starboard engines are arranged for left-hand rotation, while the other four engines turn right-handed.

Forward Control Compartment

The forward or control compartment is, in reality, two separate compartments, separately supported, but coming together at a flexible joint, marked R in the accompanying diagrammatic sketch. The forward of these two compartments is known as the control compartment, where the commanding officer, the engineer officer and the helmsmen are located. This compartment contains all the necessary control and signaling devices and a space divided off by the partition, J, where the radio apparatus and the radio operator are located. The after one of the two compartments contains one of the six power units and also a small four-cylinder rotary sleeve-valve engine, N, arranged to drive the generator which furnishes current for the radio set. This engine is a product of the Kinney Mfg. Co. A door, L, opens into the engine compartment, and a passageway at one side of the radio compartment serves as an entrance to the control compartment.

From the control compartment a ladder, I, leading up through a vertical passageway, H, gives access to the passageway in the keel of the ship and thence to the other five cars, as well as to another vertical passage-

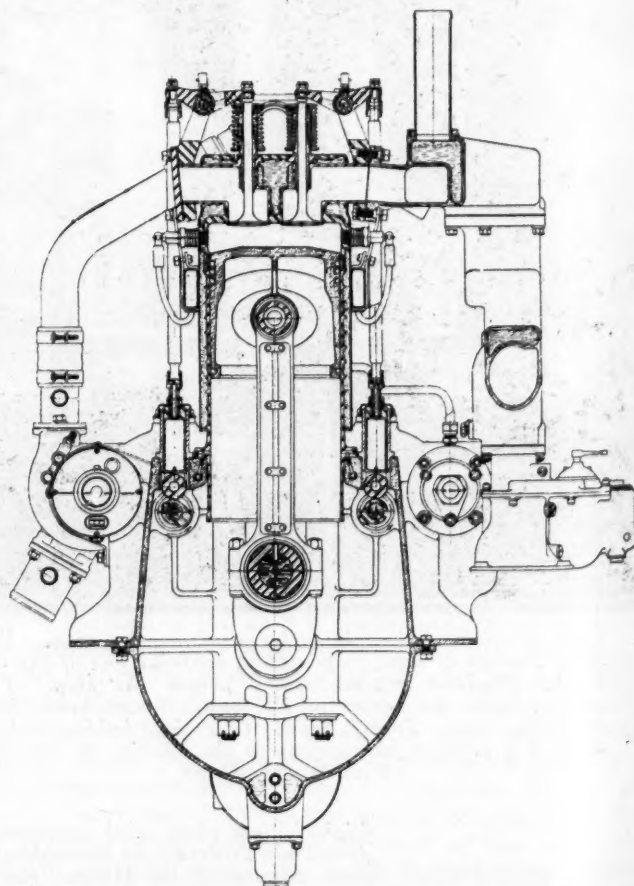
way which leads to a small deck on the top of the hull. It will thus be seen that members of the crew can pass readily from one part of the ship to another.

In the control compartment there are, beside the various navigating instruments, two helmsmen's wheels, A and B, around the drums of which pass cables which control respectively the rudder and the elevators. These cables pass upward through tubes F and G and thence along the floor of the keel compartment to the after part of the ship. C and D are dial indicators similar to those used on the bridge of a battleship. Each of these has three markers or control handles, and these are in turn connected by a cable to the markers on similar dials, one of which is located in each engine compartment. By this means the engineer officer gives orders concerning the operation of the various power units. E is a panel containing controls for numerous valves which permit the operator to discharge water ballast from any one of several ballast bags, or, if necessary, to discharge gas from any of the gas bags.

Arrangement of Power Unit

In the engine compartment, O indicates the engine, Q the gearset, built by the Allison Engineering Co., and M the radiator through which the cooling water for the engine is circulated. Air for cooling the radiator enters through the duct K and passes out through an opening in the after wall of the compartment. Air enters the carburetor of the engine through a pipe which passes through the lower wall of the compartment, and the exhaust is discharged through a similar pipe similarly arranged. The exhaust manifold is, however, encased in an outer jacket of sheet duralumin which covers also the short exhaust pipe, as shown at P in the diagram.

At the outlet of this air jacket there are three con-



Transverse section of the Packard dirigible engine

centric pipes, the outer one being the jacket itself, the inner one the exhaust pipe, and the intermediate one forming a sort of venturi ejector which utilizes the kinetic energy of the exhaust gases to draw cool air through the exhaust jacket. The upper openings in the jacket are opposite the exhaust valves and are so formed as to cause the incoming air stream to flow over the exhaust ports and assist in cooling them. The radiator, piped approximately as shown in the sketch, serves the radio engine jacket as well as that of the main power unit. A shutter is provided in the air duct leading to the radiator. Water temperature can be controlled by varying the position of this shutter.

Five Radiators Used

Except for external shape, the five other cars are similar to the rear half of the forward compartment. Each of the five houses a complete power unit. In all five the radiators are set in openings in the forward ends of the compartment, so that no overhead air duct is required. Shutters are provided as in the other case. All of the power units are provided with a clutch for declutching the propeller and a brake for stopping the rotation of the latter when this is desired.

All compartments are made up with a duralumin framework and an outer covering of duralumin sheet. An oil supply tank and oil cooler with suitable air ducts is provided for each engine. All of the cars are fitted with sliding windows with celluloid lights.

Fuel for all of the engines is carried in duralumin tanks, of which there are 48. Each of these has a capacity of 113 gal. of a mixed fuel, which is an alcohol and aviation gasoline blend. The fuel tanks are placed alongside the keel passageway and inside the envelope at various points along the keel in such a way as to be convenient to the engines but still distribute the weight

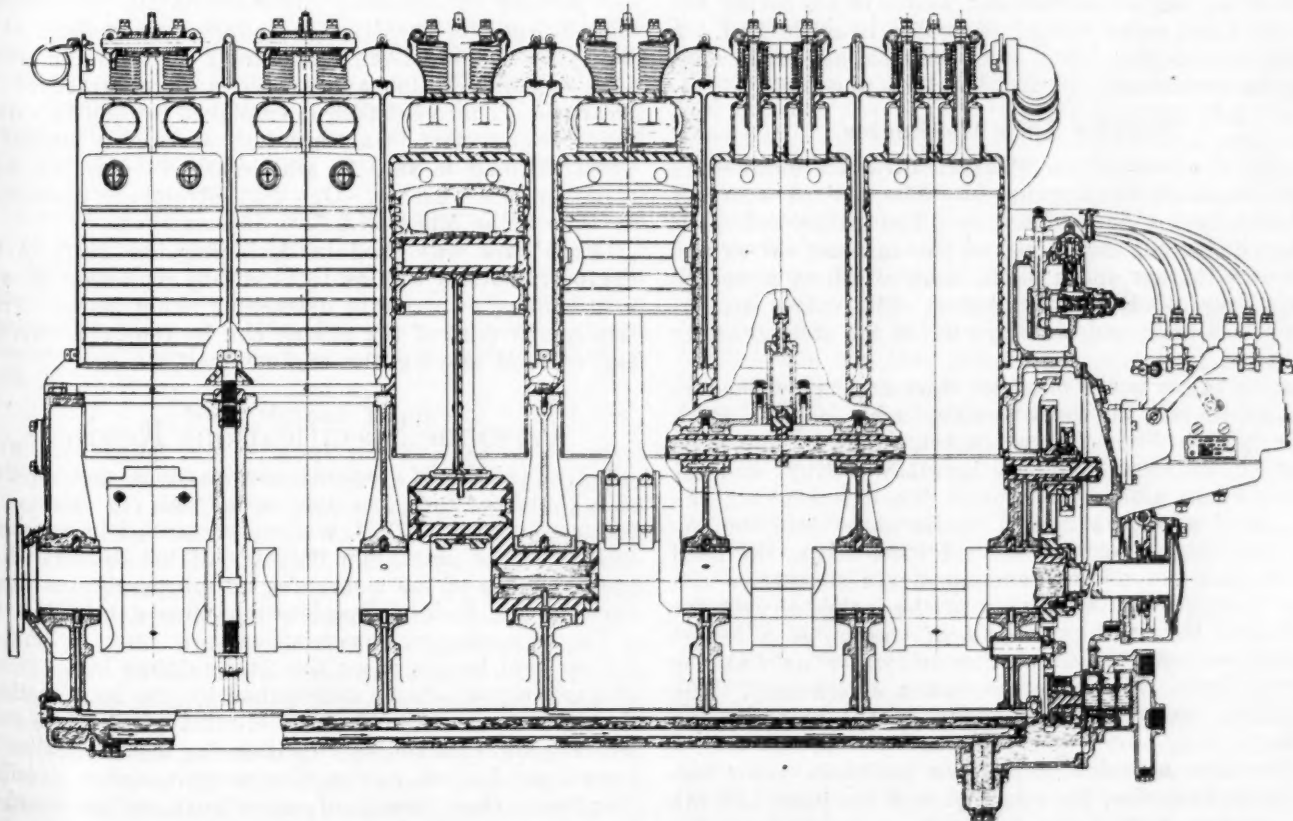
with reasonable uniformity. At other points along the passageway there are arranged a number of rubberized canvas bags which hold a total of 20 tons of water ballast. Some of these bags are arranged with control valves, which can be opened at will to discharge water. This is, in fact, one of the normal means for manoeuvring the ship. Other of the ballast bags are fitted with emergency valves which are used only when it becomes necessary to suddenly lighten the ship or some portion thereof. The valve in these emergency ballast bags is so arranged as to discharge the whole contents almost instantaneously and the valves cannot be closed from the operator's compartment once it has been opened, as can the valves in the operating ballast bags.

On account of the expense involved, especially when helium gas is employed, the valves which control the outlets of the gas bags are never opened unless the ship cannot be manoeuvred in any other fashion. The operators can, however, discharge the gas from any of the bags by operating the control cable connected to it and terminating in the control panel in the forward compartment. The valves are also arranged to open automatically in case the gas pressure becomes excessive.

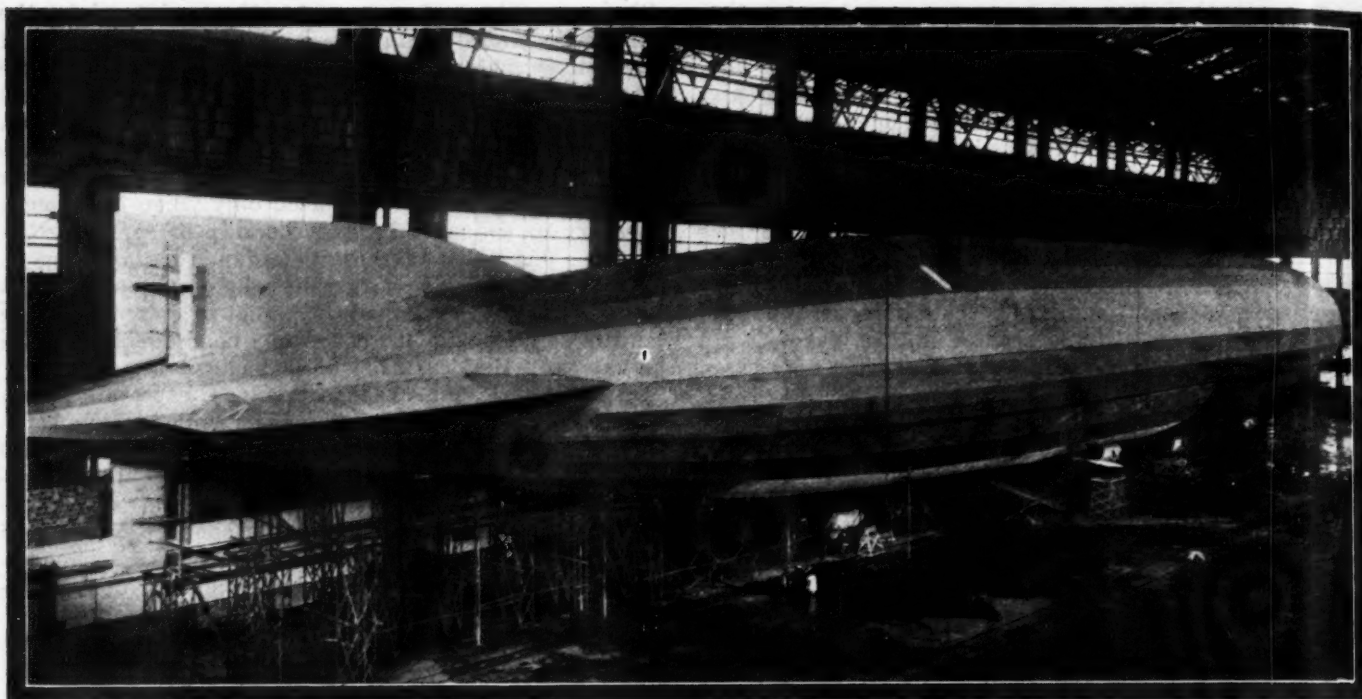
Still another emergency means for controlling ballast weight is to drop any one or more of several of the fuel tanks which are especially mounted for this purpose. In the case of these tanks the mounting devices are so arranged that when freed the connecting fuel pipe is sheared automatically and the fuel outlet thus formed closed off.

Passageway Divided

At two points along the keel passageway a space is floored over and divided off in such a way as to serve as quarters for members of the crew not on watch. Near the forward end of the passageway is a space with



Longitudinal section of the 300-hp. six-cylinder Packard dirigible engine which has 6½ in. bore and 7½ in. stroke. Cylinders are of steel with jackets and ports welded in place. Engine is made for either right or left hand rotation



ZR-1 as it appeared before floating off the ways in the great hangar at Lakehurst, N. J. All but the under sections of the outer envelope are in place. (Wide World photo)

hatches opening downward and through which handling ropes can be dropped when the ship makes a landing.

The nose of the ship carries a fitting through which a cable can be passed and attached to a mooring mast. A mast of this character is provided about a mile from the huge hangar in Lakehurst, where the ZR-1 was assembled. A hand winch is provided at the forward deck with the rope hatches referred to above. By the use of this winch the crew can assist in anchoring the ship once the outer end of the cable is made fast. A duralumin pipe for filling the water ballast tanks runs from the nose almost the full length of the keel.

Packard Dirigible Engine

Sectional views of the Packard dirigible engine are shown in an accompanying cut. The cylinders are of steel and have a bore of $6\frac{5}{8}$ in. The stroke is $7\frac{1}{2}$ in. Each cylinder has two inlet and two exhaust valves and is fitted with four spark plugs, each of which is served from a separate Delco distributor. The valves are arranged vertically and seat directly in the steel cylinder head.

The valve ports are of sheet steel and are welded in place, as are also the sheet metal cylinder jackets. Each of the cylinders has its own jacket, which is connected to that in adjacent cylinders by elbow fittings and extremely short hose connections. When assembled, the water inlet pipe is arranged to discharge into the top No. 1 cylinder jacket, the water flowing across the head and through the elbow connections into successive cylinders in series and finally out of the jacket of cylinder No. 6 into the radiator. This, of course, is a forced circulation, but the circulation of water around the cylinder barrels is by thermo-syphon action only. The centrifugal water pump is driven at $1\frac{1}{2}$ times engine speed.

Valves are operated by hollow pushrods from two camshafts located at the upper part of the base, and the valve tappets have roller followers.

A dry sump full pressure feed system of lubrication is employed, oil being delivered to all crankshaft bearing surfaces and to crankpin and camshaft bearings under

high pressure. Oil is also fed under reduced pressure to each cylinder barrel to aid in piston lubrication. The engine is fitted with a centrifugal governor, which prevents speeds in excess of 1400 r.p.m., and also an oil control which automatically closes the throttle if the oil pressure falls below a safe minimum pressure. The engine is arranged for hand cranking only, consequently it is necessary to provide a compression release. A lever for moving the exhaust camshaft axially is provided. This brings into operation secondary cam surfaces which hold the exhaust valves open during the cranking period.

A special vibrator and switch unit, mounted on the instrument board bracket, is employed to facilitate starting. This system is arranged to produce a number of sparks, which is said to aid greatly in starting, especially in cold weather. One 2-in. Stromberg carburetor, designated as Model NA-ZD5, is employed.

Great care was used in designing the parts of the engine in such a way as to facilitate replacements with a minimum of work in disturbing other parts. Practically any part of the engine can be removed from the car without moving the engine itself.

Gasoline Specifications Revised

A REVISION of Federal specifications for gasoline, kerosene, fuel and lubricating oils to become effective January 1, 1924, was recommended by representatives of the petroleum industry of the country at an open meeting of the committee on lubricants and liquid fuels of the Federal Specifications Board held recently.

The concrete recommendations are that a limit of 0.1 per cent be placed on the total sulphur in all grades of gasoline, this to be determined by the lamp method; that the unsaturation test be eliminated or made more lenient; and that the specification for motor gasoline be known as United States Government motor gasoline. The only other change of importance recommended in regard to gasoline was to discontinue the use of cotton on the bulb of the distillation thermometer.

The main change on lubricating oils recommended was the new A. S. T. M. method for determining color.

Accurate Standards of Comparison Needed in Precision Measurements

Corrections must be applied to instruments used on bearings of large size. Immersing plug gages in water before using is not advisable. Operators must be capable of handling equipment.

By Charles Hellyar*

Chief Inspector, Fafnir Ball Bearing Co.

IN the control of outside diameters and bores of ball-bearing rings—the tolerances on which are such that tenths of thousands of an inch are very appreciable quantities—it is necessary first to adopt a certain standard for the comparison of measurements. This standard should be the same as that used by the buyer, and the two standards should be checked against each other before operations are started. The standards used at The Fafnir Bearing Co. plant are the Pratt & Whitney precision measuring machine and Pratt & Whitney and Johansson size blocks.

Unfortunately the machine and the blocks cannot be used together without applying corrections, especially on the larger sizes of bearings, owing to the error introduced by the use of different calibration temperatures. The calibration temperature of the P & W machine is 62 deg. Fahr., while that of both sets of size blocks is 68 deg.

The distance between the hair lines of buttons of a P & W machine is 1 in. only when the temperature of the machine is 62 deg. Fahr. A 1-in. Johansson or P & W gage block is 1 in. only when its temperature is 68 deg. Fahr. A Pratt & Whitney machine measurement will always be smaller than a block measurement at any given temperature, and this difference for 1 lin. in. is equal to $.00000648 \times (68-62)$ or $.0009389$ in. ($.00000648$ being the expansion of steel per deg. Fahr. per linear inch.).

On work of small dimensions this error is negligible, but on a 26-in. bearing like the General Electric Co.'s No. 8280, this error becomes $.00000389 \times 26$, or a full .001 of an inch. The capacity of our P & W measuring machine is 13 in. and the difference between a block measurement and the machine at this setting would be .0005 in.

New Method Tried

On account of this error, it was decided at the start of the General Electric contract to use the Johansson blocks only in checking all gages used in connection with the job. It was also decided to have a universal bench gage with which any outside diameter could be determined and which could be readily set with the Johansson blocks. Another advantage of a universal bench gage is that the human element of "getting a feel" is eliminated. This is a pre-requisite to uniformity, as the feel is governed by a Swiss Comparator which is a non-variable quantity.

Precision measurements can be carried on at all ordinary temperatures, the only vital factor (especially when dealing with bearings of large outside diameters) being to make sure that the Johansson block set up, by which the bench gage is adjusted, is at the same temperature

as the rings that are to be measured. A good plan consists in letting the Johansson blocks lie between two bearings in a pile that are to be measured, for from 20 min. to an hour, according to the size. The measurement should also be carried on in a room free from excessive drafts and where the parts are not exposed to direct sunlight.

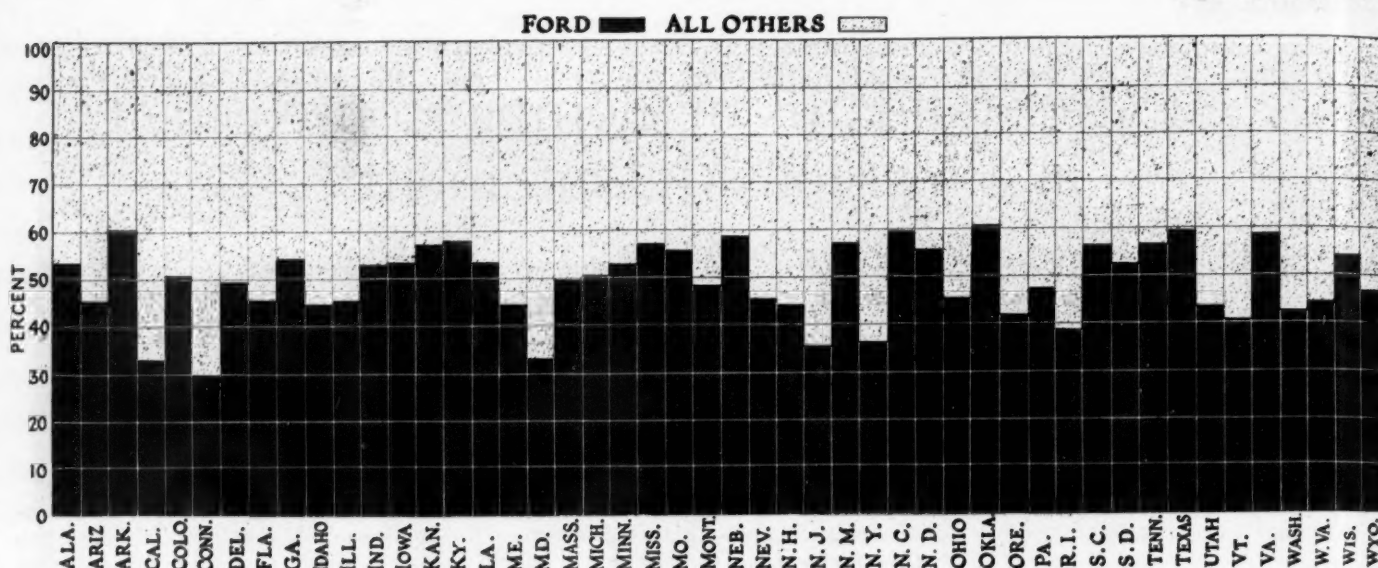
A Questionable Practice

The practice of immersing plug gages in water preparatory to measuring is a questionable one in the opinion of the writer, unless the room temperature is kept very even and the water is allowed to stand long enough to approach the room temperature. Any sudden change in room temperature will not cause a corresponding rate of change in the water temperature. In other words, the water temperature will always lag behind the room temperature. In the measurement of dimensions, such as the outside diameter of rings it is only necessary to have the ring of the same temperature as the Johansson block set up, or if the P & W machine is used, to lay the rings on the machine long enough for them to reach the same temperature as the machine. In measuring rings in the P & W machine it is good practice to allow the ring to rest between anvils a short while in order that the heat absorbed when handling the ring may be dissipated.

In grinding of especially accurate bores the only equipment really needed is a set up of Johansson blocks with feeler fingers and tubular inside micrometers, but if several parts are to be bored simultaneously, as was the case on the General Electric job, on account of the limited gage block equipment it becomes necessary to furnish plugs by which a feel can be taken with outside micrometers and then the inside micrometer adjusted to the outside micrometer setting. Plugs could not be inserted in the rings while chucked in the machines, as that would have thrown the rings out of true. Stainless steel is hard to plug-gage, as the plugs will stick and must be knocked out of the ring. This was especially the case on the large size bores. In taking a feel from the plugs care was taken to see that the plug was kept on the grinding machine in order to have it the same temperature as the soda water flowing onto the ring. In inspecting bores these same plugs were used in conjunction with inside micrometers where any bores seemed to vary appreciably from the plugs. In grinding outside diameters of the medium and smaller sizes on the machine, the operator was furnished a good pair of micrometers with a frame of Johansson blocks with rounded feeler fingers. These blocks were kept on the table of the machine.

The accuracy achieved on the General Electric job proves that the gaging methods were suitable for the work, but due credit must be given the operators.

*Reprinted from *The Dragon*.



Proportion of Fords Varies Greatly in Different States

Comprise fifty per cent of total registrations, but average does not hold in many territories. Higher priced cars are more popular in New York, California, and several other areas. Dealer organization grows from 3500 in 1914 to 8500 in 1923.

FORD cars comprise a far greater proportion of the total registrations in some states than in others. The general conception that about half of the cars in the United States are Fords is true, but wide deviations from that average exist in many states. As a matter of fact, the average can be applied properly in only about 25 or 26 out of the 48 states.

This condition has a vital bearing on marketing plans both of car builders and accessory and parts manufacturers. Where the proportion of Ford registrations is particularly high or particularly low, some reason for that fact probably exists. Whatever it is, it will have a marked influence on the sales efforts of rival car manufacturers.

Accessory and parts makers usually consider the Ford market as separate and distinct from other lines and consequently will adjust their selling plans much in accordance with the distribution of Ford cars.

A recent survey conducted by AUTOMOTIVE INDUSTRIES has developed data along this line that have never before been available and which give a strikingly clear picture of the relation of Ford registrations and distribution facilities to those of all other car builders combined. The information is based on registration figures as of Jan. 1, 1923.

At that time there were about 5,156,000 Ford cars in operation in the United States as against 5,633,000 cars of other makes. In New York state, however, which leads in total registrations, Ford is outnumbered nearly two to one by other cars.

Ohio leads all other states in number of Ford registrations with 333,900. Pennsylvania is second with 329,400,

and Illinois is third with 307,750. To show the variation in total registrations as compared with Ford totals, the following comparative line-up for ten leading states is of interest:

10 States Having Highest Total Registrations

1. New York
2. California
3. Ohio
4. Pennsylvania
5. Illinois
6. Michigan
7. Texas
8. Iowa
9. Indiana
10. Massachusetts

10 States Having Highest Ford Registrations

1. Ohio
2. Pennsylvania
3. Illinois
4. Texas
5. New York
6. California
7. Michigan
8. Iowa
9. Indiana
10. Missouri

It appears that Ford sales are particularly good in Ohio, Pennsylvania and Illinois, but that they have not been very good, relatively speaking, in New York, California or Massachusetts. This fluctuation of Ford strength from state to state is borne out by the figures shown in Table 1, which gives the registrations of Fords and that of other makes by states.

The relative standing of Ford in each of the various districts is shown in Table 2, which gives the Ford percentage of total state registrations for each of the 48 states.

The high proportion of Fords in the southern states is an outstanding feature of this table. Seven of the ten States having the highest proportion of Ford registrations are located below the Mason-Dixon line. Florida and West Virginia are the only two southern States in which the Ford percentage falls below 50.

FORD REGISTRATION COMPARED WITH THAT
OF ALL OTHERS
(1914-1922)

Year	All Other	Ford	Total
1914	971,000	405,000	1,376,000
1915	1,298,000	676,000	1,974,000
1916	1,815,000	1,103,000	2,918,000
1917	1,684,000	1,948,000	4,632,000
1918	3,410,000	2,504,000	5,914,000
1919	3,681,000	2,710,000	6,391,000
1920	4,451,000	3,450,000	7,901,000
1921	5,111,000	4,259,000	9,370,000
1922	5,757,000	5,156,000	10,913,000

At the other end of the scale, eastern states predominate with New York, New Jersey and Connecticut as outstanding examples. In the last ten, however, the west is represented as well with California and Utah.

The value of this analysis is better understood when it is realized that the present status of registrations is the summation of a multitude of merchandising and economic factors, some favorable and others unfavorable, which have been operating for some twenty years. The conditions which exist today are the outgrowth of a period of development long enough to have hardened various tendencies into actual trends. Changes will take place in the future, without doubt, but the impetus of past growth will have to be overcome in any given instance before radical deviations occur in the sales curve.

In New York and California, for instance, the higher priced cars have had marked success and will probably continue to hold a relatively large part of the market in the future, unless some serious disturbing influence enters to change the line of development which is now being followed. The same principle applies in a general way to other states.

The growth of Ford registrations in general has been steady and just a little more rapid than that of the combined total of other makes. This relation is shown in Chart 2. Ford registration growth outstripped that of other makes by a considerable margin between 1914 and

1917. From 1917 through 1922 the rate of growth of the two has been very nearly the same, with the Ford curve rising slightly faster. This condition seems likely to be reversed somewhat in the future as the proportion of second buyers increases.

The figures contained in this article are as accurate as it is possible to get with the present variations in registration practice from State to State. A few minor devia-

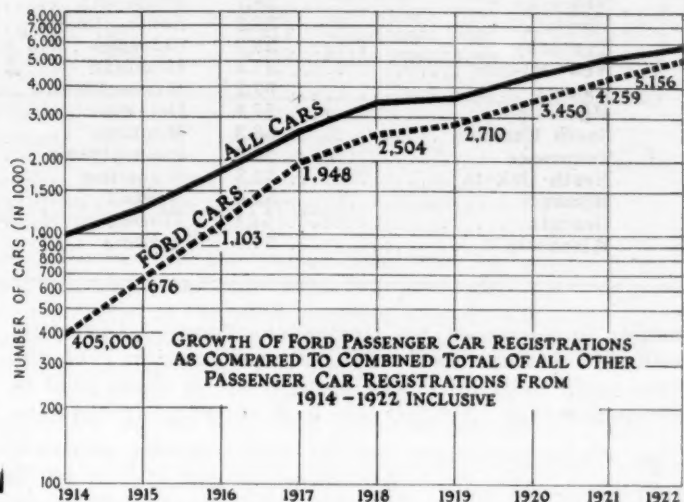


Chart 2

tions from the registration data published in the Statistical Issue of AUTOMOTIVE INDUSTRIES may be noted in the present compilation. These are due to the necessity of estimating the proportion of cars and trucks in certain States.

Chart 3 shows the relation between Ford production each year and that of all other makes. The curves give the percentage of total production each year comprised by Ford and that comprised of all other makes combined. In only one year, 1921, did Ford build more than 50 per cent of the entire output of the country, his proportion usually ranging around 40 to 45 per cent.

Ford has built up his dealer organization by leaps and

Table 1
Registration of Ford as Compared to All Other Passenger Cars by States Jan. 1, 1923

	Other	Ford	Total		Other	Ford	Total
Alabama	37,583	42,600	80,183	Nevada	5,450	4,550	10,000
Arizona	21,500	17,700	39,200	New Hampshire	23,507	18,650	42,157
Arkansas	31,425	47,000	78,425	New Jersey	166,080	91,800	257,880
California	551,194	271,200	822,394	New Mexico	10,000	13,450	23,450
Colorado	74,499	77,000	151,499	New York	495,470	285,600	781,070
Connecticut	90,329	38,300	128,629	North Carolina	66,750	96,850	163,600
Delaware	12,000	11,500	23,500	North Dakota	42,480	53,600	96,080
Dist. of Columbia	59,693	16,900	76,593	Ohio	406,530	333,900	740,430
Florida	52,842	44,000	96,842	Oklahoma	96,400	148,550	244,950
Georgia	59,054	69,600	128,654	Oregon	69,831	48,900	118,731
Idaho	27,393	22,000	49,393	Pennsylvania	361,837	329,400	691,237
Illinois	378,716	307,750	686,466	Rhode Island	32,655	20,800	53,455
Indiana	195,810	217,600	413,410	South Carolina	38,650	49,750	88,400
Iowa	219,836	248,900	468,736	South Dakota	55,391	60,750	116,141
Kansas	129,926	173,800	303,725	Tennessee	59,219	67,100	119,319
Kentucky	57,127	79,500	136,627	Texas	204,800	298,100	502,900
Louisiana	40,603	46,400	87,003	Utah	23,835	18,100	41,935
Maine	43,997	34,700	78,697	Vermont	24,591	16,650	41,241
Maryland	102,848	50,900	153,748	Virginia	60,900	85,100	146,000
Massachusetts	253,139	125,700	378,839	Washington	109,516	79,500	189,016
Michigan	259,058	259,500	518,558	West Virginia	56,350	44,700	101,050
Minnesota	161,872	179,450	341,322	Wisconsin	166,122	195,100	361,222
Mississippi	30,230	40,200	70,430	Wyoming	14,610	12,800	27,410
Missouri	156,875	196,500	353,375				
Montana	28,831	26,850	55,681				
Nebraska	96,558	137,100	233,658				
					5,756,911	5,156,350	10,913,261

Table 2
PROPORTION OF FORD PASSENGER CARS TO TOTAL PASSENGER CAR REGISTRATIONS,
JANUARY, 1923

Oklahoma	60.6	Louisiana	53.3	Ohio	45.1
Arkansas	60.2	Alabama	53.2	Illinois	44.8
Texas	59.3	Iowa	53.1	Idaho	44.5
North Carolina	59.2	Indiana	52.6	New Hampshire	44.2
Nebraska	58.7	Minnesota	52.6	West Virginia	44.2
Virginia	58.3	South Dakota	52.3	Maine	44.1
Kentucky	58.2	Colorado	50.8	Utah	43.2
New Mexico	57.4	Michigan	50.1	Washington	42.1
Kansas	57.2	Massachusetts	49.6	Oregon	41.2
Mississippi	57.1	Delaware	48.9	Vermont	40.4
South Carolina	56.3	Montana	48.2	Rhode Island	38.9
Tennessee	56.2	Pennsylvania	47.7	New York	36.6
North Dakota	55.8	Wyoming	46.7	New Jersey	35.6
Missouri	55.6	Nevada	45.5	Maryland	33.1
Georgia	54.1	Florida	45.4	California	33.0
Wisconsin	54.0	Arizona	45.2	Connecticut	29.8

bounds to dispose of his tremendous output. Operating with 3500 dealers to sell a 240,000 production in 1914, the Ford retail sales force was brought up to about 8550 to merchandise the 1,100,000 cars built in 1922. In 1914 the

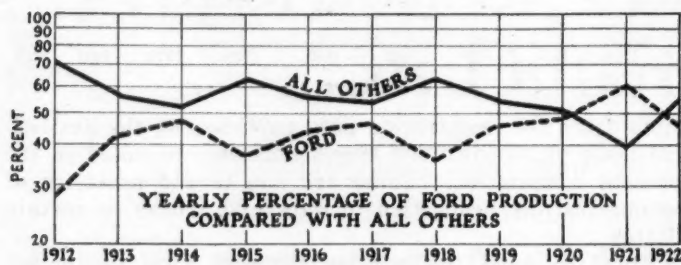


Chart 3

dealers disposed of an average of 69 cars each. In 1922 the average sales per dealer were 129.

The average number of Fords per dealer in operation in 1914 was 116; in 1923, 603. Among other makes of cars there was one dealer for every 76 registrations in

1914 and one dealer for every 177 registrations in 1923. The greater number of cars per dealer in the case of Ford is expected because of the low price of the Ford car.

The relation of the number of Ford dealers to the Ford registrations in each of the various states casts some interesting light on the discussion about how many dealers are needed in different areas to produce a given number of sales. The States which have the highest number of Ford dealers are not the states which have the highest number of Ford registrations in many cases.

States in Order of Number of Ford Dealers

1. Pennsylvania
2. New York
3. Illinois
4. Iowa
5. Ohio
6. Texas
7. California
8. Missouri
9. Michigan
10. Minnesota

States in Order of Ford Registrations

1. Ohio
2. Pennsylvania
3. Illinois
4. Texas
5. New York
7. Michigan
6. California
8. Iowa
9. Indiana
10. Missouri

Table 3
FORD DEALERS BY STATES

	Sept., 1914	March, 1918	1922	1923		Sept., 1914	March, 1918	1922	1923
Alabama	21	53	87	88	Nevada	9	17	22	32
Arizona	14	22	37	39	New Hampshire	34	50	43	44
Arkansas	24	49	91	95	New Jersey	107	149	171	169
California	143	225	374	407	New York	215	432	494	509
Colorado	41	88	112	114	New Mexico	11	19	40	38
Connecticut	37	89	63	62	North Carolina	42	86	146	140
Delaware	7	17	16	17	North Dakota	98	152	180	180
District of Columbia	2	5	9	9	Ohio	144	396	439	432
Florida	32	63	91	96	Oklahoma	51	99	220	221
Georgia	46	92	162	174	Oregon	30	54	116	97
Idaho	18	35	62	67	Pennsylvania	169	379	695	585
Illinois	236	416	482	496	Rhode Island	7	11	17	15
Indiana	123	212	256	265	South Carolina	16	51	82	80
Iowa	322	455	443	468	South Dakota	92	143	163	160
Kansas	181	240	269	268	Tennessee	25	55	101	104
Kentucky	32	88	111	115	Texas	74	179	406	415
Louisiana	14	45	86	67	Utah	6	19	38	40
Maine	34	79	70	69	Vermont	24	49	55	55
Maryland	30	57	94	84	Virginia	27	72	116	121
Massachusetts	82	138	171	159	Washington	45	103	149	141
Michigan	109	228	326	331	West Virginia	17	44	58	72
Minnesota	208	322	307	319	Wisconsin	149	267	374	371
Mississippi	22	38	87	90	Wyoming	11	18	29	33
Missouri	119	207	246	257					
Montana	42	70	87	88	Total	3,492	6,420	8,544	8,553
Nebraska	151	243	251	255					

Ohio, which has the greatest number of Fords in operation, stands fifth in the dealer list with a total of 432 as against 585 for Pennsylvania. Iowa, which has 469 dealers, ranks four below Texas in registrations although the last named State has but 415 dealers.

These data as regards Fords are specially interesting because the character of the Ford product has given it a widespread distribution throughout the country and under nearly every conceivable condition of local competition and trade. Some relation does seem to exist between the number of dealers and the number of registrations, but it is very intangible in character and cannot be reduced to mathematical terms at the present time.

An accompanying table gives the number of Ford dealers by states in 1914, 1918, 1922 and 1923. Following is a digest of Ford dealer and registration information:

	Ford Dealers	Ford Registrations	Cars per Ford Dealer	Other Dealers
Sept., 1914	3,492	405,000	116	12,760
March, 1918	6,420	2,504,000	390	21,473
March, 1919	7,220	2,710,000	375	22,511
Nov., 1922	8,544	4,800,000	562	30,456
Jan., 1923	8,553	5,156,350	603	31,765

New Piloted Boring Bar Developed

THE rigid features of the piloted boring bar have been applied to cutter heads carrying turning tools at large diameters by the overhead pilot bar which has been introduced recently by Warner & Swasey. This bar has been developed in conjunction with a plain turning and facing head as illustrated in Fig. 2. The equipment is intended for machining parts which cannot readily be supported through the center of the piece or require a more rigid tool mounting than can be obtained with the usual tool holder on the turret face.

The disadvantages of overhung tools have long been recognized. Whenever the cut is heavy a weaving action results from the necessary freedom of the carriage or turret support on the ways and tends to produce a finish of varying quality and size. For boring cuts this trouble is obviated by piloting the bar carrying the tool or cutter in a bushing in the spindle. As the free end is supported, the distance from the tool to the nearest point of support is reduced and the reaction on the carriage is downward upon the ways rather than of a rotary character. Consequently the hole bored will be uniform and true to size.

These advantages also pertain to the new overhead pilot bar, which is mounted at the top of the plain turning head and projects into a bushing mounted on the inner spindle bearing cap. The bracket which carries the pilot bushing has a forked base that straddles the bearing cap and is held down by long bolts at the bosses provided for the original bearing cap bolt heads. A formed steel chip and splash guard is hinged on a pin secured to this bracket. Three set screws which secure

the pilot bar in the cutter head can be adjusted to properly align the bar with the pilot bushing. When the character of the work permits, the overhead bar can be used in conjunction with the usual center bar to still further increase the rigidity.

A typical set-up is shown in Fig. 1. The tool arrangement on the idle head prevents the use of a pilot bar at the center. Also, as the greatest pressure or reaction will be set up by the tool having the greatest leverage, the overhead bar, which is nearest to it, offers the maximum of support. The tooling, which is located in the working position, illustrates another application in which both central and overhead bars are used for making internal and external cuts simultaneously. As the pilot bushing extends out over the clutch, the length of the overhead bar is no greater than that of the longest boring bar. Therefore, no greater floor space is required when using the new equipment.

A NEW form of chain track for agricultural tractors has been developed in Germany. It is claimed that the use of a chain track of which the individual links are connected together by means of bearing pins or the like is expensive.

The new track comprises an ordinary link chain with cross bars at the middle of the links, track plates of pressed steel being bolted to these links. Chains of the type described are said to be a regular article of commerce and therefore comparatively cheap. Only every second link has the cross bar, the other links being of the conventional form.

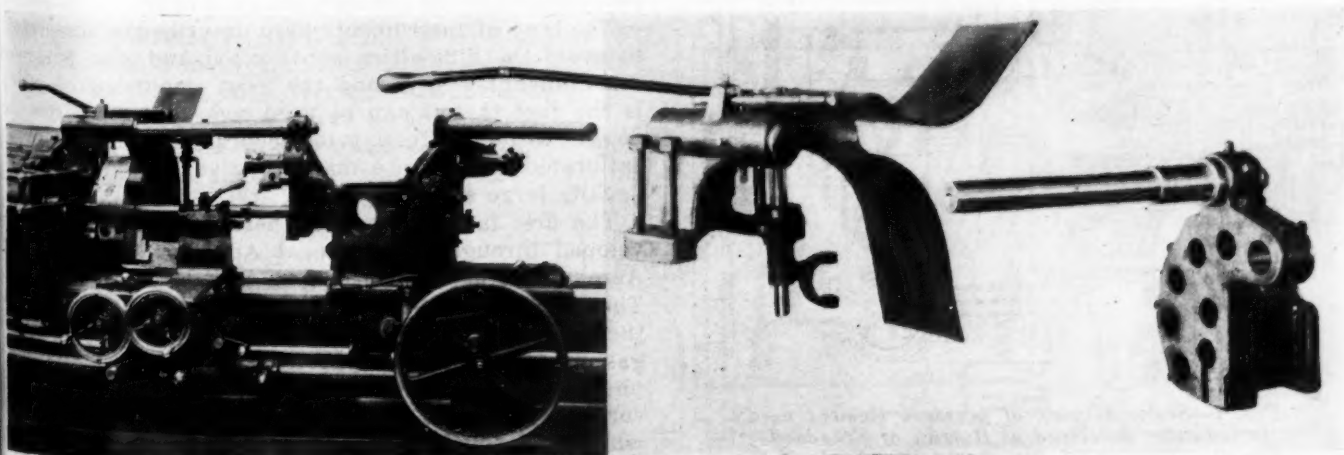


Fig. 1—Typical tool arrangement in connection with which pilot bar offers advantages

Fig. 2—Overhead pilot bar and pilot bushing bracket

Recording Indicator of Balanced Diaphragm Type Now in Use

Possesses notable advantages over other kinds in respect to accuracy and dependability. Uncertainties from inertia effects, vibration and delicate parts are absent. Card is said to be as easily made as is that produced by pencil in low speed steam engine indicator.

FOR many years the need for an accurate and reliable form of pressure indicator to use in testing relatively high speed internal combustion engines, such as are generally used in automotive practice, has been keenly appreciated by engineers doing research and experimental work in this field. Many attempts to design such indicators have been made, but all of these have suffered from certain disadvantages which adversely affected their reliability and convenience.

Only in quite recent years has an approximately satisfactory solution of this problem been reached through the development of two indicators of the balanced diaphragm type. Both of these are a more or less outgrowth of the war and the particular need for such instruments in the study of aircraft engine performance. Both have been developed by Government laboratories,* one in this country and one in England. The important elements of the two instruments are so similar as to lead to the inference that the latter, a British product, is an outgrowth of the earlier American development, although we have no specific information to the effect.

*Most of the information here given is taken from Report No. 107 of the National Advisory Committee for Aeronautics, written by H. C. Dickinson and F. B. Newell, and describing a high speed engine pressure indicator developed at the Bureau of Standards, Washington. Particulars regarding the indicator developed by the British Royal Aircraft Establishment are drawn from a paper on engine testing read by H. R. Ricardo before a graduate section of the (British) Institution of Automobile Engineers.

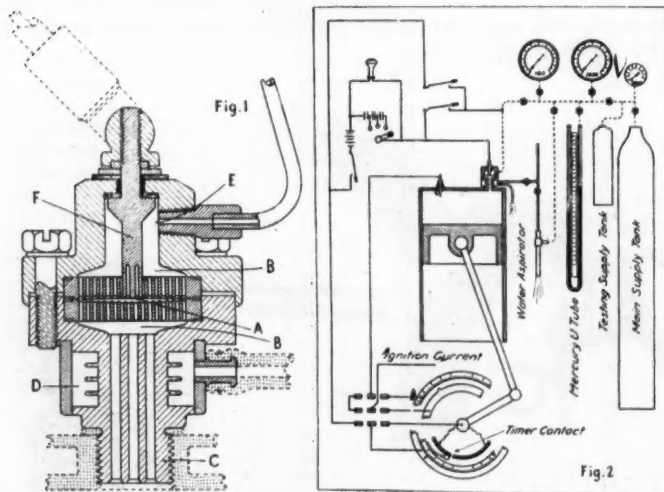


Fig. 1—Sectional view of pressure element used in indicator developed at Bureau of Standards
Fig. 2—Diagram of Bureau of Standards indicator assembly showing arrangement of pressure element, timer, pressure system and electric circuits

Some of the difficulties which have prevented the development of wholly convenient and successful indicators of the type in question are the inertia, friction and back lash of moving parts, where mechanical means of recording are adopted and vibration of the system when a photographic method of drawing the card has been employed with the indicator close to the engine. To avoid the effect of vibration on an instrument mounted upon the engine a flexible tube has sometimes been used to connect the pressure element and the recording elements which it actuates, with the engine cylinder. This has led to a time lag of the gases in the connecting tube and to consequent uncertainties as to the accuracy of the card drawn.

Relative Motion Recorded

A further difficulty which has been sometimes overlooked, especially in the testing of aircraft engines with relatively light and more or less flexible heads, is the fact that if the pressure element is a piston or diaphragm the motion of which is to be recorded, and if this element is mounted on the cylinder head in order to avoid long tube effects the motion actually recorded is always the relative motion between the movable part of the indicator and the supposedly fixed part mounted on the cylinder head. If, however, the cylinder head itself flexes under pressure or mechanical vibration the motion of the "fixed" support relative to the movable piston is recorded and magnified as well as the motion of the piston relative to its support. Hence, it may happen that the relative motion of the piston is not always directly proportional to the pressure which it is desired to record.

The type of instruments here described is understood to avoid the difficulties above cited and also possesses other advantages, among the most important of which is the fact that it can be used some distance from the engine without affecting its accuracy. It is also easily calibrated and can be made to give a diagram of unusually large size.

The first instrument to be here described is that developed through the National Advisory Committee for Aeronautics at the Bureau of Standards, Washington. The fundamental principle of both instruments involves the balance of the cylinder pressure against a measured gas pressure on the opposite side of a metallic diaphragm of negligible stiffness and the indication or recording, by means of a timing device, of the instant at which the equality of pressure occurs. The pressure balancing element, which is designed to be screwed into an opening in the engine cylinder such as a spark plug hole, is shown in Fig. 1. A thin metal diaphragm, A,

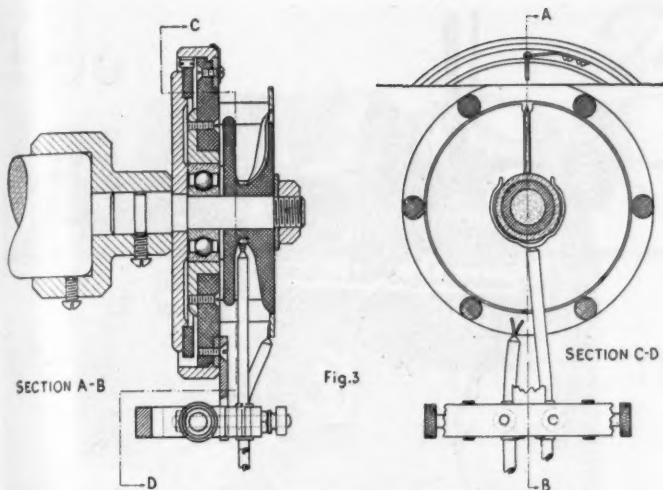


Fig. 3—Two views of timer used with Bureau of Standards indicator showing segment with contact brush, at top of figure, and rotary spark gap for indicating time of ignition

divides a chamber, B, into two parts, the lower one connecting directly with the engine cylinder by screwing the threaded portion C into a spark plug hole. The cylinder pressure is thus communicated to the diaphragm with virtually inappreciable inertia or lag such as would be involved if a long passage were used.

This close connection to the engine necessitates water cooling which is provided by an annular water circulation through the chamber D.

Balancing pressure is impressed on the top of the diaphragm by compressed air or gas through small copper tubing connected to the opening E. Motion of the diaphragm when the pressures are out of balance is limited to 0.005 in. by upper and lower supports in the form of circular plates or brass disks about 3/16 in. thick perforated with No. 60 drill holes and surfaced with concentric corrugations where the disks have contact with the diaphragm.

The upper support is plane except for the corrugations, while the lower one is concave on the surface next to the diaphragm, or 0.005 in. less in thickness at the center than at its periphery. The supports prevent distortion of the diaphragm beyond its elastic limit, while they may be changed readily when occasion demands.

The diaphragm measures 1 1/4 in. in diameter and from 0.003 to 0.006 in. thick, according to conditions in service. When clamped in the annular supports the free diameter is about 1 in. Steel diaphragms have been used most often, although phosphor bronze has given satisfactory service. Diaphragms plated with nickel and silver to prevent corrosion have been used with success. The time lag of the diaphragm is so small as to have no appreciable effect in any practical condition met in practice.

Pressure above the diaphragm can be held constant at a given value from a fraction of a second to as much longer a time as required and can then be varied up or down by suitable controls. Below the diaphragm the pressure fluctuates with the functioning of the engine throughout its cycle of operation, but usually at only two points in the cycle is the pressure balanced.

Except for these instances, the diaphragm will therefore be pressed against one support or the other.

It will be noted that the upper support is connected with an insulated electrode. The electrical connections are such that a circuit is opened when the diaphragm breaks contact with the electrode and is again made when the diaphragm contacts with the electrode. As shown in the diagram, Fig. 2, a battery is connected in the electrode circuit in such a way as to cause a click in a telephone receiver when the circuit is made or broken. It will be seen that this occurs at the instant when the pressure on each side of the diaphragm is exactly balanced. This pressure is then readily determined by an ordinary pressure gage connected to the upper chamber, B, of the pressure element.

Although it is possible by the means indicated to determine readily the fact that certain pressures occur in the cycle, additional means are required to determine the phase of the cycle at which this pressure exists. For this reason some timing device positively driven in synchronism with the engine is required, and such a device is shown diagrammatically in Fig. 2 and to scale in Fig. 3. It will be seen that the timer is so arranged that current can flow through the telephone receiver during only 1/2 deg. of arc. The brush which makes this contact is a piece of hardened steel fastened to the end of a flat spring so that it will rub on the periphery of an insulated disk which is the part driven by the engine. The brush is carried by a graduated ring mounted on a ball bearing and arranged concentric with the rotating disk in such a way that it can be rotated by hand and set at any desired angle with an index line on a portion of the frame that is movable with respect to the engine.

Auxiliary Device Used

An auxiliary device on the timer indicates the point in the engine cycle at which the ignition spark passes. This has no direct bearing on the use of the apparatus as a pressure indicator but is useful in plotting the ordinary indicator diagram because of the importance of accurately locating on such a diagram the moment of firing the charge. A condenser is shunted across the telephone so that when the circuit is closed the condenser is charged and can discharge through the phone, thus intensifying the sound. When maximum pressures

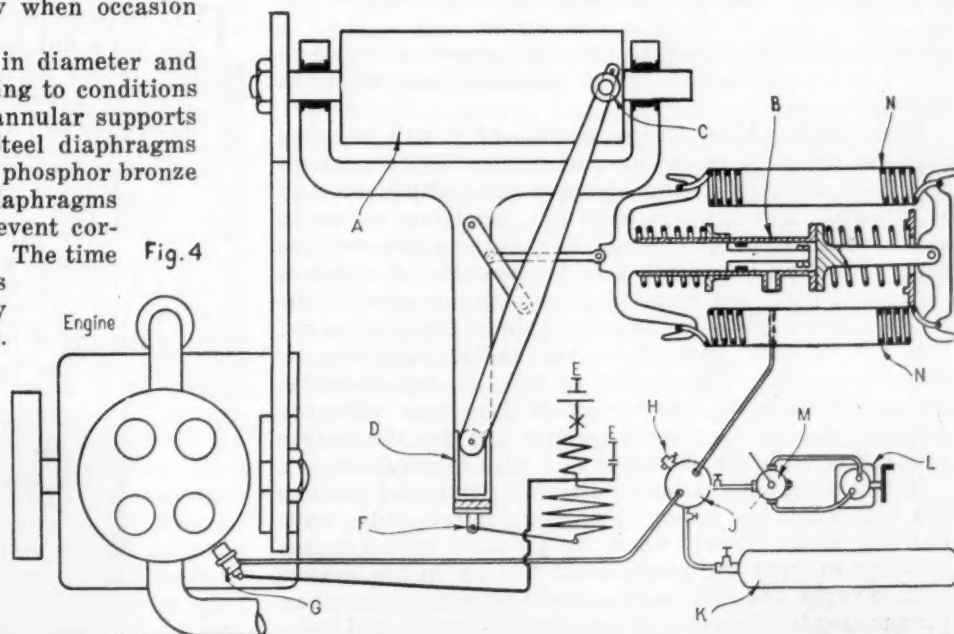


Fig. 4—Diagram showing arrangement of R. A. E. indicator assembly

are being measured at slow speeds, the snap in the receiver is disagreeably loud. To make this sound dull, yet audible, a larger condenser is shunted across the phones. Faults in the circuit are more conveniently located if switches for short circuiting the indicator and timer are provided.

In addition to the pressure element and timer, there is required a source of high pressure, such as a tank filled with compressed air or liquid carbon dioxide, and a source of sub-atmospheric pressure, such as a chemist's water aspirator. Control is effected by a number of $\frac{1}{8}$ -in. needle valves arranged as shown in Fig. 2. The actual measuring instruments are Bourdon tube dial gages of suitable range, and a mercury monometer for measurement of pressures up to two atmospheres absolute. A standard 100-lb. gage is used from 15 to 100 lb. per square inch above atmosphere and a standard 1000-lb. gage for pressures from 100 to 1000 per square inch.

Accurate Results Secured

With the apparatus thus far described, it is possible to secure accurate data on the basis of which to plot a complete average indicator card, but no means for automatic recording are provided.

Referring now to the R.A.E. indicator, shown diagrammatically in Fig. 4, it will be seen that, while the principles involved are identical with those of the indicator described above, a recording device has been added. The

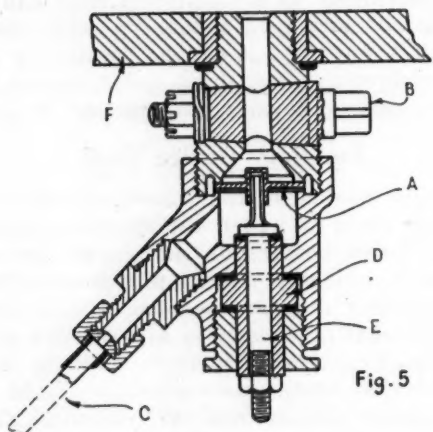


Fig. 5—Pressure element used in R. A. E. indicator

pressure element used with this instrument is shown in Fig. 5 and a photograph of the assembled instrument in Fig. 6.

From the last three figures mentioned, it will be noted that the pressure recording and timing device consists of a drum carrying a sheet of paper upon which the card is "drawn." The drum is, of course, positively driven in synchronism with the engine. Across the surface of the drum moves an indicating arm, the position of which is dependent upon the position of a piston controlled by the pressure applied to the outer side of the diaphragm, that is, the side away from the engine cylinders, by suitable springs. The motion of this arm is, of course, comparatively slow, varying as it does only with the gradual change of pressure controlled by the valves connecting with the air bottle and with atmosphere.

In this case, a low tension current is connected through the disk when the latter is bearing against either seating, but at the instant when the pressure in the engine cylinder exceeds the pressure of the air in the system or vice versa, the disk passes from one seat to the other, thus momentarily breaking the electric circuit and causing a spark to pass between a pointer carried on the

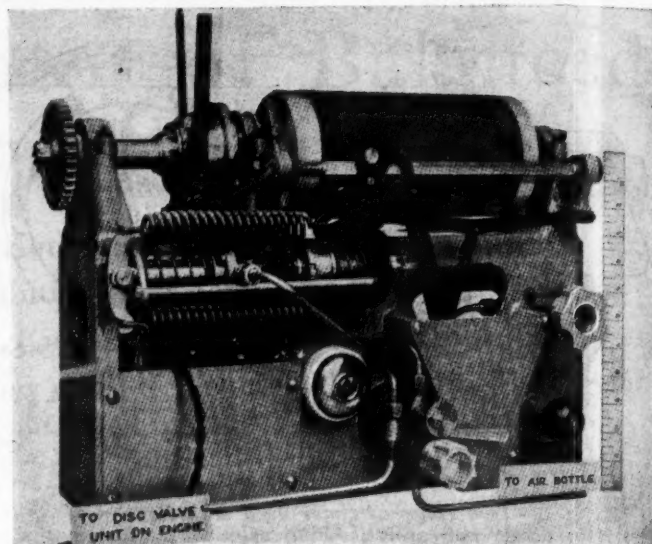


Fig. 6—Recording mechanism which forms novel part of R. A. E. indicator

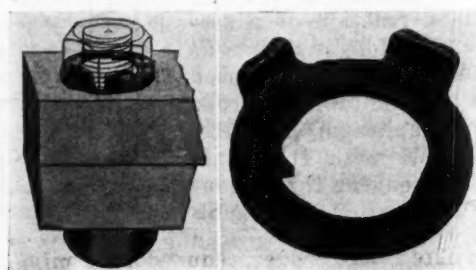
arm which traverses the drum and the drum itself. The passage of the spark leaves a mark on the paper which traces the card in a series of dots. With this indicator it is said to be possible to trace the card practically as fast as it can be traced with the slow speed pencil type indicator used in steam engine testing.

The pressure time diagram drawn by this indicator measures about 7 x 13 in. It has been employed in drawing cards of aircraft engines in actual flight at various altitudes, and is described by Ricardo as accurate at speeds at least as high as 2500 r.p.m., easily operated and thoroughly robust.

It would thus appear that it is now possible to make an indicator for automotive engines which is dependable and should prove even more useful as a device for studying the performance of these prime movers than the old-fashioned pencil indicator has proved in connection with the low speed steam engine.

New Nut Lock

THE Waynesboro Nut Lock Co. has placed on the market a nut lock of an unusual type which is said to have shown its holding power in rail tests. It is in the form of a washer provided with two turn-up flaps on the outside and a sort of saw tooth on the inside. The principle of operation is the same as that of the alligator wrench: The nut can be tightened but cannot be backed off. Upon tightening the nut the tooth engages the thread, thereby preventing the nut from moving backward, even though a wrench may be applied to it. Owing to the rake of the tooth, the greater the force applied to unscrew the nut the tighter the lock becomes. If a turning movement is applied in the opposite direction the tooth recedes and permits the tightening of the nut.





The FORUM



What Is the Ideal in Motor Bus Design?

R. A. Whittingham, Chief Engineer, Atlas Axle Co., thinks trolley cars offer many ideas for adaptation, particularly as regards bodies. He discusses a recent article by A. F. Masury. Believes that radical construction changes may be needed in some cases.

Editor, AUTOMOTIVE INDUSTRIES:

Mr. Masury's article in your issues of July 19 and 26 on the fundamentals of motor bus design is so interesting and informative that it seems hypercritical to take exception to any part of it. Since, however, comment is invited, might not he have gone even further in pointing out special requirements for the development of that class of motor vehicle which shall be the ultimate bus or the public passenger car of the streets and highways? By ultimate bus is meant that type of car, of various dimensions and capacities, which shall be designed in every detail for the specific service to be rendered as public conveyances properly maintained and operated for the service and convenience of the public.

Roads and buses, or roads and trucks, their extension and improvement, are as dependent, each upon the other, as the track and rolling equipment of the railroads. Surface, gradient and alignment are daily pushing their favorable facilities farther and farther, until the necessity of operating in ruts, mud and sand is rapidly disappearing. But what of these roads and their future? Were it not for the motor car they would not yet be. Progressively, the road engineers are building them better and better, and yet they are but as yesterday. As they improve in physical condition, so undoubtedly must they in the future offer better and safer means for accommodating the growing mass of fast and slow, light and heavy traffic which is coming. Already in urban and suburban districts this traffic is increasing so rapidly in density that one hardly dares contemplate their condition even a few years hence if all classes of vehicles, trucks, buses and swarms of light cars must travel the same narrow roadway.

When the railroads came they laid their single tracks along the line of least resistance, with scant regard for alignment, so long as practicable grades and low costs of rights of way were obtainable. Ever since they have been expending vast sums in improving those grades and curvatures, and in assigning multiple tracks to various classes of traffic; otherwise it would have been impossible to handle the volume of business forced upon them by the industrial development of the areas they serve. To a considerable degree the coming of our good roads is analogous. With them, too, we first followed the easiest and least expensive way by more or less adequately surfacing existing highways, and only in very recent years have alignments been changed, sharp corners eliminated and grades reduced to a minimum.

Is it likely that the mere indefinite extension of these excellent improvements, at least in densely populated and industrially developed areas, will be sufficient in the future for the rising tide of motor driven traffic? Will the single track be expected to furnish way for the highly speeded cars, the ponderous trucks, the routed and scheduled buses with their frequent stops? Consider conditions in and around our cities and larger towns that have arisen during the past five years; consider the terrible toll even now taken of human lives; then look ahead twenty-five, or even ten, years, and we know that it will not. Inevitably must we profit by railroad experience and improve alignment, eliminate grade crossings, broaden and assign roadways, segregate traffic, and this, too, before our highways are swamped by the coming flood of motors, even as the railroads are now struggling with inadequate facilities in the same territories. The years to come are to see an, as yet generally unappreciated, increase in the volume of passenger and freight movement by motor-buses and trucks as this young land of ours increases and multiplies its population. In their operation, railroads, public service corporations, traction companies, and other competent organizations will probably have a leading part, so that it is difficult indeed to measure or limit the future growth and usefulness of this young giant of transportation.

Although improved highways are the effect and not the cause of motor car development, the unprecedented rapidity of their extension, the enormous sums spent and to be spent, and the far-reaching plans for further construction on a scale but lately undreamed of, makes it appear that a period of mutual stimulation has been reached; i. e., more motor cars must be produced because good roads are increasingly available, and more good roads must be projected because motor cars, in ever larger numbers, are coming to utilize them. In this situation lies opportunity. Passenger and freight traffic by motor has yet to be systematized, organized and coordinated with the existing great transportation facilities; many problems in connection therewith are to be solved, but just as surely as the progress of the last few years points to greater things to come this will happen.

In viewing that for which the near future warns us to prepare, Mr. Masury does not seem to have carried the fundamentals of modern bus design quite so far as they might have been. In his article he apparently em-

phasizes the adaptation of conventional units to a bus, rather than to advocate obtaining the best possible characteristics in a vehicle so distinctly a thing apart as the coming bus will be, by a redesign of those units directly affecting this result. Nearly all the excellent structural details so well grouped and exhibited by him are equally desirable for other classes of motor cars and thoroughly appreciated by competent engineers. Therefore, when considering the ideal bus, let us progress a little into special, or rather distinctive, design and see if gratifying results cannot be obtained.

There is no lack of precedent for the ideal motorbus. Essentially it is that highly developed public conveyance, the trolley car. Freed from its confining tracks, lightened and refined in detail, necessarily somewhat smaller in dimensions, it remains in the expectation of its patrons just that carrier which evolved from the ancient horse-car in obedience to their demand for speed, safety and convenience. Surely the general fundamentals of that so nearly perfected prototype are the fundamentals of the bus. That it carries its power plant with it and must be modified accordingly is of no concern to its passengers. It offers transportation and shelter and it rolls on wheels; therefore, it must furnish all they are accustomed to in that vehicle which, to a certain extent at least, it aspires to replace. Not to do so is a step backward. To do more is but to justify its being.

If it is granted that the most modern arrangement of the trolley-car body, for either urban or other service, approximates the ideal, then the bus body must equal that arrangement to attract and properly serve the traveling public. Furthermore, the bus, as a vehicle, should provide superior service in flexibility of operation and continuity of progression. It can do both.

Indifferent as the passengers may be to the manner and arrangement of the power plant that propels them, in that power plant and its harness is centered the interest of the engineer. Since the provision of such units to the highest present development of the art is well within his ability, why then should not that ability be further directed toward giving the riding public a possible maximum of safety and comfort if the bus is to be so popularized as to compete on even terms with its established rival? Let us see what that possible maximum comprises.

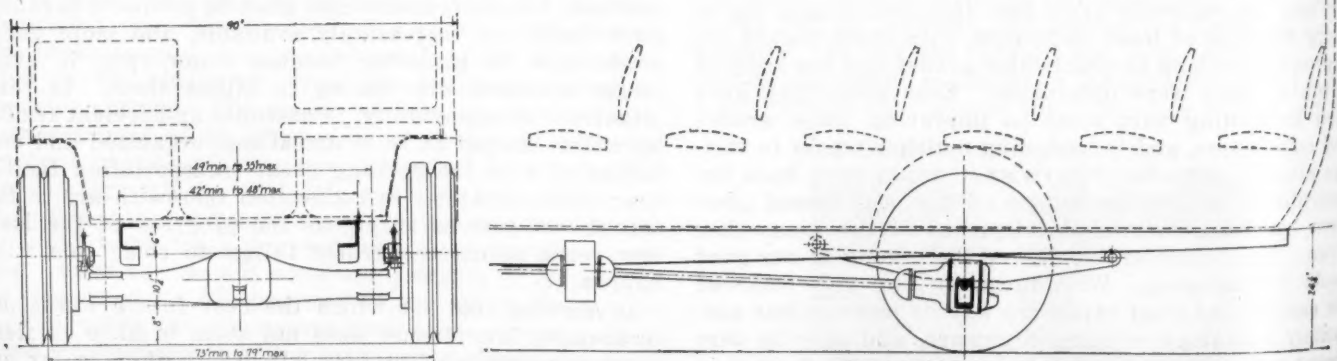
Given adequate motive power and a well-arranged body within its limitations fully equal to electric road practice, then the degree of safety and comfort attained for the riders depends no less upon the manner of mounting the body than upon the mechanical sufficiency of the chassis construction. When rapid transit leaves its rails and betakes itself to the highway, new factors in the problem of safety and comfort at once present themselves. No longer do predetermined direction, per-

fect surface, absolute stability and indifference to other vehicles ease the minds of its patrons.

A lurching, swaying, unstable conveyance will go far in nullifying the soothing influence of a quiet transmission and effective brakes to the perpetuation of that by no means small proportion of prospective patrons who say, "I am afraid of those buses—so many of them upset." Exaggerated and untrue of the best buses now being built? Of course, and yet that prejudice is more real and widespread than is generally realized. Fostered, unfortunately, by the large number of hybrid buses and irresponsible or incompetent drivers yet operating, the impression prevails to some extent that buses are not the safe, reliable conveyance that the trolley car is, whether on city streets or the open highways. Comment by the daily press on those occasions when buses have superseded a trolley service during a strike or for other reasons, has played up the physical handicap of the bus to the conclusion that it is not a satisfactory substitute. Criticism to the advantage of the trolley car boils down to the fact that, being operated on fixed rails, the danger of skidding and a possible overturn is eliminated; as is also the necessity for skill and attention on the part of the driver in picking his way and avoiding collision with other vehicles.

These are stock criticisms of the trolley advocate, and exploitation in the press gives them an exaggerated importance in the minds of the public, with a natural effect on the cautious or timid. The overturning of a bus from skidding or collision in the hands of a well-trained driver is of rare occurrence, but "Safety First" still governs, and so far as the best possible design and construction can do so it should be made impossible. To look into the opportunities of the near future and to exert every effort for distinctive design which will result in that low-hung, steady, comfortable and convenient car so generally desired, is to accomplish much toward banishing prejudice and popularizing the motorbus.

Distinctive design, when dealing with the fundamentals of chassis construction for bus service, means little after all but a rearrangement or reshaping of those transmission or load-carrying members which in their hitherto employed form do not permit that the body shall be mounted so low as to obtain to the fullest extent the desired characteristics. Smaller wheels than usual are but an effort in that direction at some sacrifice of easy rolling and good proportion. Brake drum diameters and effective braking surface are proportionately diminished, with corresponding loss of valuable retarding effort and brake lining life for a given brake shoe pressure. Domes or other obstacles or projections above the floor level as further aid are but a makeshift and should not be considered in clean-cut design. They are not necessary to



Bus axle which affords 25-in. floor height on flat floor, straight frame, 36-in. wheels and ample clearance

take care of propeller shaft brake or gearset in a floor so low even as 24 or 25 in. What, then, is the unit which, given sufficient clearance both above and below, limits floor height to a minimum of 31 or 32 in. over that member, although every obtainable inch below that minimum is so desirable? Obviously, the rear axle.

Mr. Masury's diagrams illustrate the feasibility of obtaining frame heights of 28 and 29 in. by resorting to the use of 32- or 34-in. wheels, a pressed steel floor dome and rather shallow frame section over the rear axle described by him. Width of tread can be made all that body limitations permit, but it is the combination of wide tread with low center of gravity which most greatly increases stability and steadiness, together with the comfort and confidence of the riders. At so low an elevation, the importance and desirability of a few more inches is very real—those few inches cannot be gotten with a truck type axle even by the aid of floor domes and 32-in. wheels, if these features can be considered conventional.

I have ventured, therefore, as of possible interest, to inclose a diagram illustrating an axle in which general outline of design is so arranged as to afford a 25-in. floor height with a perfectly flat floor, straight frame, 36-in. wheels, and ample clearance at all points. Since no mechanical novelties are involved, description is not necessary further than to say that I am heartily in accord with Mr. Masury's opinion that such an axle should be of the gear-driven, double reduction type, and most emphatically of sound, conservative construction.

The other factor of width of wheel centers is of equal importance, of course, with height of center of gravity in making for the maximum of stability. Here, thanks to our rapidly extending good roads and the equally rapid shrinking necessity for operating on poor ones, we are limited only by body width. Width of wheel tread is of no moment on roads fit for bus operation in so far as surface is concerned, but it is a prime factor for the other reasons previously stated.

It is to be regretted that body width restrictions vary in different States from 90 to 114 in.; a few States not officially limiting that dimension at all, and, although it is desirable, especially for interstate traffic, to have a maximum standardization which will afford the best arrangement of seating and standing room, it has not yet been done. On this basis, in standardizing an axle, at least for present general use, it seems necessary to establish a tread so that maximum advantage is taken of the minimum legal body width, and the accompanying diagram is drawn accordingly. If dual pneumatic tires are used, the wheel centers necessarily become a little narrower, but without affecting axle specifications when the wheels are designed, as they should be, a component part of the axle construction.

Possibly the not very distant future will bring a standard maximum body width in all States which will allow seat and aisle room closely approximating that enjoyed in trolley cars. When we do have such a body, low-hung on wide wheel centers, we will be very close to the ideal bus.

R. A. WHITTINGHAM, Chief Engineer,
Atlas Axle Company.

An Opinion on Brakes

Editor, AUTOMOTIVE INDUSTRIES:

My views on the subject of four-wheel brakes are given briefly in the following paragraphs:

For many years I have been convinced that there is room for great improvement in the braking system on

nearly all American cars. It is evident, of course, that, since braking capacity is limited by adhesion between the tires and the ground, brake capacity can usually be doubled by braking on four rather than on two wheels. The four-wheel braking system has the advantage of distributing tire wear due to brake reaction and increasing tire life. Experience in racing, both in America and in Europe, has proved the necessity and safety, as well as the dependability of four-wheel brakes.

The concern with which I am connected has experimented with brakes operated by air, liquid and mechanical means, and has reached the conclusion that the mechanical type without servo mechanism is the most satisfactory and reliable. In our view, a brake should not require adjustment, once it is in the hands of the user, until the facing is completely worn out. Ease of operation and freedom from rattles and dragging, equal braking ability in either forward or backward motion of the car, and interchangeable parts as between front and rear brakes, are considered essential. It is desirable, also, to have a construction in which the brake lining covers substantially the full circumference of the drum.

With front-wheel brakes it is desirable that the knuckle pivot pin be perpendicular and so arranged that its axis meets the ground at the central point of tire contact, in order to relieve the tie rod of unnecessary strain. It is desirable to have the knuckle pivot pin at right angles to the axle, for the reason that an inclined pivot is apt to give a dangerous tilt to the wheel when rounding corners. Tires are sometimes rolled off by the strain which results from the tilted construction. It is desirable, also, that the construction be such as to give minimum friction in steering and exclude dirt and dust, which cause rapid wear. I favor a construction in which the knuckle pin is offset rather than tilted to give a casting action.

I also favor the use of an expanding type of brake, made in at least three or four sections, with cast-iron shoes which will still act as a friction surface even though the linings be entirely worn away.

You will observe that the desirable features of construction here enumerated are all incorporated in the Lavoie four-wheel brake design which has been described heretofore in your columns. It is my belief that a car owner who has once tried a well-designed four-wheel brake equipped car will never again be satisfied with a two-wheel brake type. I also believe that the police authorities will soon come to require four-wheel mechanically operated brakes as a means of greater public safety.

A. J. LAVOIE.

Italians Develop Fuel Oil Carbureter

AN Italian carbureter for fuel oil designed for use on farm tractors and trucks has been brought to this country by Siliro A. Gormi of New York and will shortly be demonstrated to interested parties. When the engine is being started the carbureter forms a mixture of air and both gasoline and fuel oil, but as soon as it has become heated up the feed of gasoline is automatically shut off. Records of tests made in Italy show the carbureter to have operated on fuel oil of a specific gravity of 0.88. The usual difficulties of smoky exhaust, carbon formation in the cylinders and dilution of the crankcase oil are said to have been overcome. The heat of the exhaust gas is used for vaporization, there being exhaust jackets on the mixing chamber of the carbureter and the inlet manifold. The proportion of the exhaust gases passing through these jackets can be regulated by means of a valve.

Volume Should Grow Faster Than Cost

Expense should be held
down in good times to
keep business balanced

By Harry Tipper

"THAT'S a fine-looking statement in all respects but one," remarked President Billings of the Planet Motor Car Co., as he looked up from his copy of the report which had just been read by the treasurer. His eye ranged from one to the other of his associates as they sat round the big table in his office.

"We have made a good profit, our reserve is all right and our volume of business has been gratifying. We can congratulate ourselves on our present showing, but our expense here is too high. We should not parallel so closely the line of volume when we get toward a maximum. It is not quite safe to have the charges run that way. I would like to see a bigger leeway. We are not going to have such good years as this all the time and expenses are hard to eliminate when they have become a part of the organization."

"I don't quite agree with that," said John Carter, the vice-president. "I think our trouble is mainly that our prices are too low. We are making too much car for the money. We do not get what such a machine is worth."

"I think, with the president, that our expenses are too high," Frank Lane, the treasurer, broke in. "I have watched them and I know that we have added in almost every direction at an astonishing rate. Also, the departments do not remain at any certain point. Once an activity is started it grows and grows. Each quarter you can see the expense go up."

"That's all right," said James Chance, the sales manager, "but we're making money. Each year we have come out with a good profit, and as we grow we're bound to increase all our active departments materially. For instance, we did not have a service department a few years ago, but we can't expect to get along without quite extensive work of that kind now. I don't see how we are to keep expenses down and pile up the reserves regardless of the problem."

What Shall Be the Price?

"Furthermore, I don't agree with John about the price of the car. Every time we increase the price we increase sales resistance. It is all very well to say that we should get what the car is worth, but who is to say what its value should be if not the buyer. We can sit here and make a lot of remarks about prices, but after all we will sell the car at the price which meets our market best."

"Anyway, I think this is more or less a fuss about nothing. If we weren't making money it might be worth while to holler about it, but, under the circumstances, I can't see that there's much point to it."

"That's where you're wrong, Jim," returned the president. "What I have said is no criticism of the organization and should not be taken that way, but here are a

"It doesn't matter nearly so much where you are at the moment, as where you are going," says President Billings of the Planet Motor Car Co. after reading the financial statement of his company. He points out that an activity once installed is difficult to uproot without danger to organization and morale.

few things to be taken into consideration. Expenses are hardly ever carelessly increased when business is bad and no money is going into profit or surplus. Then every man's eye is on the expense sheet; everything which can be done is being done to keep things at the proper place.

"Additions to the organization occur naturally in the course of good business, and they may easily occur carelessly—not without good ideas behind all the movements, but not always thought through. It is a regular process, the creeping in of inefficiencies at such a time. Isn't that true in your factory, John?"

Balanced Production

"Certainly, that's true. In the first place, when we weed out we keep only the best men we have. Then they know we are in a tight place and they watch their step. We can keep a better contact with the entire operation of the factory and in a hundred little ways we can prevent useless, or at least unnecessary, expenditure."

"On the other hand, when we are busy there are a hundred ways in which we spend just a little more than we should. Everything is working at top speed; there is a certain amount of carelessness from lack of detailed examination. Then the average of help is not as good, because we must take them more as they come. Yes, I think there is a distinct tendency to become less efficient when we are very busy."

"I think the plant is most efficiently run when we are reasonably busy, but not so filled up that we can't spend time on maintenance and detailed watching of the plant and equipment operation. Of course, it is not as profitable then, perhaps, but it is run better under those circumstances."

"I've noticed that condition in your factory reports a number of times, John," replied the president. "But that does not get at the heart of the matter. You do not get why I brought this up as yet, I can see. I remember reading in a book or an article one time about a man who said 'it doesn't matter where you are at the moment nearly so much as where you are going.' I've thought about that a good deal since, and I believe it more and more every time I check it up. When times are good and we are making money, we do not pay much attention to the tendencies, because we are in a good position any way—also when things are bad we just look at our position and arrange accordingly, expecting that nature will take its course regarding the future."

"I've seen lots of concerns in bad times just get round to cutting down the organization when they should have been building it up. Yes, sir, I've seen a few months' heavy loss work havoc with a board of directors, and if

they only knew, it cost them five or six times as much building back again afterward; and I've seen things slipped through in good times, that should have meant an investigation, because the profit sheet looked all right.

"So I'm pretty well tied to the doctrine of that chap who said, where you are going matters most, particularly in organization matters.

"Now, let's apply that to this line of volume and line of expense. You see how nearly the curves and fluctuations in the one agree and parallel the other. That means danger to me; not now, not this year, but in the near future. Sometimes when business is not so good and we have to figure a little closer, that expense line will not come down as easily as it went up. We are not watching the effectiveness of our work as we should. As our volume gets bigger there should be a somewhat larger area between expense and volume, so that the fat will be available to make up for the lean.

Expenses Increase

"I don't hold with this idea that we can always depend on increasing the volume and take care of the expense that way. Pretty soon we shall arrive at the point where the increase in market possibilities will not be nearly so important as the fluctuations of the business, and then we shall have to turn a larger profit on a smaller gross discount. Then the detailed expenses will count and count heavily.

"I would not mind so much if these expenses were of the fluctuating kind generally, so that they could be easily reduced, but many of them are organization mat-

ters, which grow into the system of the business and are uprooted with difficulty and sometimes disaster to the operation and the morale."

"I think I get you now a little better, chief," Jim Chance remarked, "and I am inclined to agree with your viewpoint. Of course, it is going to be difficult to do the thing you are talking about, because it requires eternal watching and weighing of each item. Yes, sir; it is something of a job and not likely to show any results in the course of a few weeks. I don't believe I can analyze so thoroughly in any part of the business in any such time."

Change Comes Slowly

"That's all right, Jim; I don't expect you to. Calvin will tell you that it sometimes takes a year to make a change in a carbureter which can be O. K'd as a wise improvement and justified. If we are willing to spend that time on a detail of the product, we should be in a position to determine the value of each activity of the organization, which is certainly as vital to our business as the product itself.

"I go back to what I said in one of these meetings some time ago. We spend a vast amount of time on the careful arrangement of product, machinery and equipment. We have no such statement as, 'it can't be done,' and we are not allowed to omit one detail of the examination.

"It is necessary for us to begin such methods with our organization work, so that we can thoroughly blueprint the activity, the necessity and the value of each operation."

Regulating System Prevents Battery Overcharging

AN arrangement for preventing overcharging of automobile starting and lighting batteries and at the same time eliminating the risk of excessive voltage on the circuits of generators with third brush control through accidental disconnection of the batteries has been patented by the Fiat company of Italy. The positive and negative brushes, A and B, of the generator are connected to the battery K by the mains E and H. Within the latter is included the cut-out switch I, of which O is the magnet and J the return spring.

The field winding of the generator is indicated by D, and is connected between one of the main brushes and the third brush C, the two resistances, F and G, being included in the circuit. One terminal of the field winding is connected to a fixed contact M located opposite the movable contact N of a vibrator, which is actuated by the electromagnet Q and the counter spring R. The movable contact is connected to one of the terminals of the field winding and at the same time to the resistances F, G. The fixed contact P is directly connected to the main E.

The battery being connected to the line by means of the cut-out I, control of the voltage is obtained normally by the third brush system, which is suitably displaced with respect to the plane of commutation, and in which use is made of the field distortion to compensate for the increase in speed of the generator. When the battery is charged, the vibrator begins to act as an output limiting device, so as to prevent over-charging.

The blade of the vibrator, when in the position of

rest, touches the contact P, thus short-circuiting the resistances G and F, permitting the exciting current to flow directly from the commutator brush A to the field winding D. If the voltage of the battery increases, the voltage of the generator increases also, and then, under the action of the electro-magnet Q the contact N will move away from the contact P, which will result in cutting down the field current. The contact N, continuing to obey the electro-magnet, makes contact with M, thereby short-circuiting the field winding.

When the battery is disconnected the third brush system does not keep the voltage constant. The system here described is claimed to limit the voltage under this condition, because the vibrator then goes into action, serving as a voltage regulator.

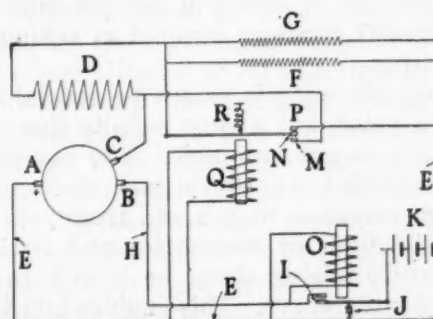


Diagram of Fiat voltage regulating system for variable speed generators

AUTOMOTIVE INDUSTRIES

AUTOMOBILE

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Specialization Has Limits

SPECIALIZATION in merchandising as well as in production has been carried forward very rapidly in recent years. Shops and stores devoted to selling a single article have grown up in nearly every line. The hat shop, the shoe shop and the shirt shop have become familiar all over the country. Similar specialization can be noted in the automotive industry with special retailers devoted to selling cars, or trucks or tires.

Marketing efficiency is raised by specialization up to a certain point, but a very definite line exists beyond which it is not profitable. The car dealer, for example, finds that his vehicle sales fluctuate considerably from month to month and from year to year. By taking on lines of accessories and tires and by actively merchandising them, he is able to stabilize his monthly profit curve. This enables him to become soundly financed and to become more efficient as a car dealer.

Vice versa, the sale of tires is increased when in the hands of a retailer whose other lines help take up the slack in tire sales at certain times. A dealer handling tires alone is often driven to expedients for realizing on his investment which would not be necessary if he had other lines to rely upon.

The trend in automotive retailing appears to have turned the corner and to be moving toward automotive dealers, handling a complete line of automotive products.

Industrial Training Benefits Industry

ONE of the chief arguments against industrial training has been that when a manufacturer spends time and money educating a worker in a particular line, the latter may quit work and enter the employ of a rival. This objection has been met by far-seeing executives with the statement that trained men are necessary and that somebody has to do the training, taking whatever chances are involved of losing the man after his apprenticeship period has been completed. If every manufacturer accepted an individual responsibility for training, moreover, it is obvious that he would profit from his neighbors' work as much as his neighbor profits from his.

Selfish attitudes toward industrial education frequently have been put to rout by the practical benefits derived by those manufacturers who have done considerable educational work. Among the latest of these broad-gage efforts is the three months' Buick Authorized Instruction Course, given at the Flint Institute of Technology, which has been thrown open to the country at large. While the training is designed specifically to provide competent Buick mechanics for various service stations throughout the nation, it is certain to do its part in increasing the supply of good mechanics and in providing better maintenance for cars in general. The students are charged a small tuition fee covering the cost of the instruction.

Old forms of apprentice training are not suitable to modern industry and new methods of industrial education must be developed on a broad scale to provide the mechanical skill necessary to perform the multitudinous tasks of large scale manufacturing.

Used Cars in Foreign Markets

THE used car is just beginning to be a factor in foreign markets. During the last few months an increasing number of reports have been drifting in from all parts of the world saying that foreign dealers are being troubled with trade-ins. This situation was bound to arise sooner or later, and the problem can be met most effectively by devising means for solution in the early days of its growth.

American manufacturers can aid foreign dealers materially by placing before them the methods used here to meet the difficulties and by explaining how to avoid the pitfalls which are to be encountered. While the used car problem is far from being solved in the

domestic market, our experience has led to the development of many, highly effective means of minimizing its evils. The results of that experience should be given to foreign dealers in a systematic and continuous campaign of educational work. American trade papers reaching foreign dealers can help.

In many places it will be necessary to build up a used car market from nothing. In others, a market already active will have to be cultivated in a constructive way. The volume of future car exports will depend to a large extent on the success achieved by foreign dealers in disposing of used cars at a profit.

Safety Must Have More Consideration

IN the abstract it is generally conceded that safe operation should be a primary consideration in laying down the design of any vehicle, yet a desire for low first cost sometimes leads to compromises in construction of both cars and trucks which have left much to be desired from the safety standpoint.

It is a real satisfaction to note that serious efforts to improve brakes is being made by many car and truck makers and that betterment of steering systems and lighting equipment also is not being overlooked. There is, however, still a great deal of room for improvement in all of these elements.

Poorly made brakes of questionable design and inadequate size, lined with inferior materials, are still to be found. Much the same can be said truly, regarding steering connections, which often rattle loose and wear with excessive rapidity, while the inferior design and construction of headlamps must be evident to every driver who has occasion to use much traveled highways at night. Frequently great improvements can be made at negligible expense, yet some unsafe equipment is turned out year after year so long as it sells.

This policy has already resulted in much ill-will and considerable corrective legislation which might have been largely avoided. As the number of cars and trucks in use increases, conditions in respect to operating hazards will become worse rather than better, so that there is no time like the present to correct faults.

Domestic Glass Production Needed

AMERICAN manufacturers of automobile bodies of the more expensive types, with few exceptions, have experienced much difficulty for a long time in obtaining an adequate supply of glass of the right quality. They have been, and still are, to a considerable extent, dependent upon imports from Belgium. These are not adequate to their needs and the situation is becoming increasingly serious as the demand for closed bodies expands.

Belgian manufacturers, it is understood in this country, have entered into a "gentlemen's agreement" to maintain prices at the present high levels by limiting output. Most American purchasers operate through jobbers and have to take what they can get. An effort is made by the jobbers, apparently, to make

an equitable division of the best of the glass, but commitments are filled out with a poorer quality. Buyers have little recourse but to accept what they are sent, for the supply is so limited vendors would have no difficulty whatever in finding new outlets for all they can get.

It seems unfortunate that the American automotive industry is dependent in so large a measure upon foreign producers for the better grades of glass needed for the construction of closed bodies, as well as for the crude rubber which goes into tires. With so great a demand in this country and with every indication that it will be permanent, it had been expected that American glass makers would attempt to meet Belgian competition more fully, but apparently they have made no serious effort to do so.

Henry Ford, however, proposes to make himself independent by manufacturing enough of the better grades of glass to meet his own needs. W. C. Durant recently acquired a glass factory of his own, and the Fisher Body Corp. has had its own sources of supply for some time. These facts are encouraging. There is no apparent reason why the United States should not make all the glass it requires, and it may be that automobile companies will lead the way.

Wiring Standards

IT is now nearly ten years ago that the first attempt was made to standardize the ground return wiring system for lighting and starting installations, to the exclusion of the insulated return or two-wire system. However, such uncompromising opposition to the plan was developed at that time by a few makers of electrical equipment, who considered the insulated return system safer and generally superior, that the scheme was dropped for the time being.

The only advantage of the insulated return system is that an accidental ground at any part of the circuit will not cause a short circuit and therefore will not interfere with the operation of the system, as it would with a ground return system. However, with an insulated return system there is substantially twice the length of wiring, and consequently about twice the chance for a ground to occur. Moreover, if a ground does occur on such a system there is nothing to indicate it, and the car will usually be continued in operation until another ground develops on the other side of the circuit, which, of course, means a short circuit. There is, therefore, very little additional security to compensate for the extra cost and the extra complication of the insulated return system.

It seems that the Lighting Division of the S. A. E., Standards Committee is about to return to the proposition of abolishing the insulated return standard, and as a preliminary it has circularized the truck manufacturers with respect to their preference and experience. As a result it was found that opinion in favor of the ground return system is practically unanimous, several makers using the insulated return system indicating a preference for the ground return system. The question of the relative merits of the two systems therefore seems to have worked itself out in a natural way, exactly as was expected.

GOOD SALES PROSPECTS FACE INDUSTRY

THE outlook for business in the automotive field continues remarkably good. August sales show an increase over July, raw material prices have continued to decline, and stock prices have responded somewhat to the conditions exhibited in the industry.

The strong features of the picture are:

- (1) Continued demand for new vehicles maintained through the period when a drop usually is expected.
- (2) Continued drop in raw material prices, showing larger area of possible profit.

The weak features are:

- (1) Abnormal volume of industry in comparison with general trade. Sales in the automotive field are 40 per cent above general business volume.
- (2) Decline in the volume of general business, although the outlook is better.
- (3) In comparison with past averages the present volume is out of line.

There is a tendency in some quarters to cut the prices

of cars. This may arise from a feeling that resistance to sales is bound to appear or it may be an actual reflex of the market tendency and in answer to retailers' reports showing slackening interest on the part of the buyer.

It is unlikely that the present unusual position of the automotive industry in comparison with general business will continue indefinitely. On the other hand, the strong position created by the volume of business this year places the industry where a natural shrinkage will offer an opportunity to do many of the things required in keeping extensive plant and equipment in thorough condition.

Sooner or later the lessened profit from the smaller volume of general business in many lines must have its effect on sections of the buying public and bring the volume of automotive sales more nearly into line with the general position. The year, however, already has provided a volume of business sufficient to justify the most optimistic and, regardless of any uncertain factors, the position of the industry is sound and stable.

Conditions in chief distributing centers as reported by correspondents of AUTOMOTIVE INDUSTRIES are as follows:

Earnings by Farmer in Iowa Showed Improvement in Last Two Weeks

Des Moines

DES MOINES, IOWA, Sept. 4—Just now the Iowa hog seems to be the factor which the motor car interests of the State are watching closer than any other, for it is on the porker that they are depending to furnish the stimulus to trade during the next six weeks.

For a number of months hogs have been at a low price, but during the past two weeks their price has improved and, as the Iowa farmer is the all-important personage in the automobile business of the State, dealers and distributors are counting on a better feeling among the farmers to help out the fall business.

While prices have been low for months, figures secured from one of the important agricultural weeklies published here show that more money has been brought into the State from the sale of hogs this year than usual. Should the price continue to improve as it has for two or three weeks, a favorable September business is anticipated by local distributors.

During the past two weeks retail sales have fallen off slightly, and the registrations in Polk County have been fewer. This decline is attributed to a seasonal slump and the influence of uncertainty brought about by the announcement of new models and prices.

Milwaukee

MILWAUKEE, Sept. 4—The best month of August on record is reported by ten of the leading dealers in Milwaukee. September business is expected to duplicate if not exceed that of August. One of the main reasons is that the representative elements of the population

of Wisconsin had opportunity to inspect the 1924 models issued by leading producers at the annual Wisconsin State Fair in this city.

The feeling of Milwaukee dealers and distributors following this exposition was one of enthusiasm, due to the excellent volume of business actually booked, and the encouraging expressions heard from show visitors, which included city and country people in every line of endeavor.

Indicative of the good buying power of farmers in Wisconsin, the leading dairying State of the Union, is the report made by the representatives of a prominent agricultural publication. Visitors to its booth at the fair grounds, it is stated, exhibited \$5, \$10 and \$20 bills in such a way that it was almost impossible to keep supplied with change. In every former year the proffer of cash was usually in \$1 bills, with \$5 as a maximum.

Seattle

SEATTLE, WASH., Sept. 4—The fall outlook in the Puget Sound region is better than had been expected. Present prospects point to a good selling season and continuance of highly satisfactory business for cars of all classes this summer.

The Ford assembling plant, which in years past has found August a month in which to build up stock for future orders, is still working on unfilled orders for the first August since it was established here.

Used car dealers are in good shape, and the stock carried is not so heavy as last fall. Used cars are being held at reasonable figures.

Cincinnati

CINCINNATI, Sept. 4—With the volume of automobile sales throughout this district holding up strong throughout the month just past—the traditional "slump" month—Cincinnati dealers are more than enthusiastic over the autumn outlook.

Both new and used cars sold unusually well in August in the Cincinnati territory, according to officials of the local dealers' association, nor were the sales confined to any particular price range or model.

With the coming of fall, the dealers naturally expect to sell more closed cars, and the prevailing opinion is that they will be able to make prompt deliveries throughout the season.

Consumers' money is free, but money for business expansion rather tight, according to the reports. Farmers are buying cars, and the commercial vehicle sales are also satisfactory.

Detroit

DETROIT, Sept. 4—Detroit distributors and dealers are looking for a good closed car business throughout the fall season, those dealers who are able to get the cars and make deliveries being in an especially good position to get business. The season as viewed by dealers will be distinctly a closed car one, and efforts are being concentrated upon the prospects for cars of this type.

Buying in both new and used cars has been and is expected to continue good in the industrial cities of the State, with increasing buying from farmers.

(Conditions in other cities on page 497.)

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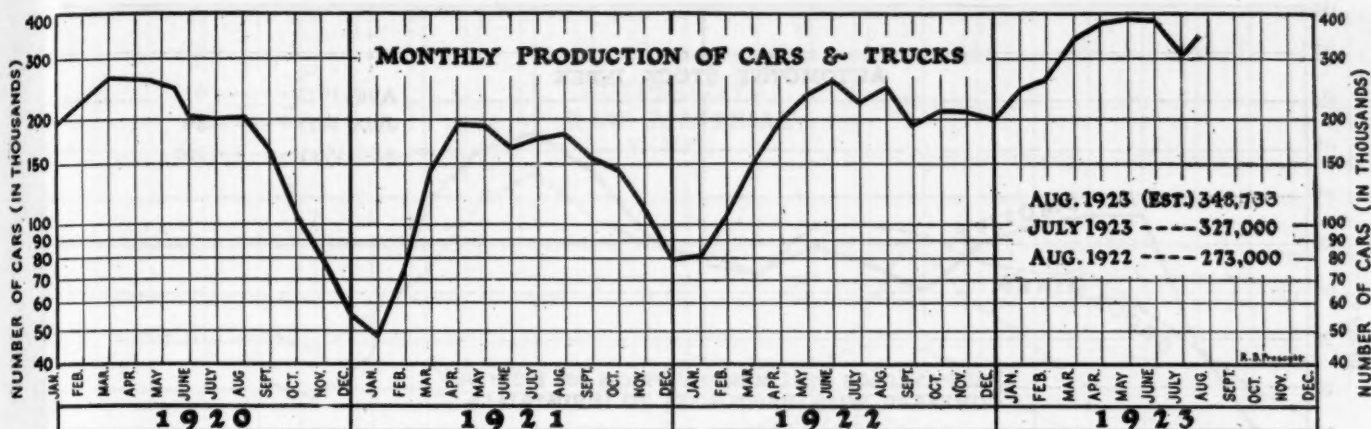
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OUTPUT IN AUGUST REACHED 348,733



Total for 8 Months Is 40,000 in Excess of All of Last Year

NEW YORK, Sept. 4—Shipping returns received by the National Automobile Chamber of Commerce place August production at 348,733 cars and trucks, an increase of 6.5 per cent over the previous month. This figure indicates that the industry has picked up the thread of manufacture that was dropped when plant operations declined in July.

August production this year exceeds the 272,589 total of August, 1922, by 76,144, and is more than 40,000 greater than July, this year. This is all the more remarkable because of the handicap occasioned by the introduction of new models by several of the units in the General Motors group, by Dodge Brothers and Studebaker, and the slowing down of Ford because of radical changes in body design.

The pickup of August brought about the creation of a new record in that the total production for the first eight months of 1923, 2,701,771, exceeds the total of 2,659,064 for the full year of 1922, which represents the peak year in American automobile production. In other words, the industry starts in on September with more than 40,000 "velvet" in its record breaking dash, and it is only a question of how much the high-water mark of 1922 will be beaten.

The figures indicate that the grand total for the year is going to be close to 4,000,000. The average monthly production for the first eight months of 1923 was 337,721. If that is maintained for the remaining four months the count would be in the neighborhood of 4,051,-

Increase of 6.5 Per Cent Over July Production Shown in Figures of National Automobile Chamber of Commerce

NEW YORK, Sept. 4—Shipping figures compiled by the National Automobile Chamber of Commerce for August give an estimated production of 348,733 cars and trucks.

The following table gives the statistics for the first eight months of this year and for the months of 1922:

	Output		Carloads		Driveaways		Boat	
	1923	1922	1923	1922	1923	1922	1923	1922
January	243,104	91,109	35,223	15,357	30,027	7,479	726	143
February	276,467	122,366	36,147	19,636	43,600	10,173	882	180
March	354,319	172,720	44,372	27,758	62,656	16,917	1,940	560
April	382,001	219,558	44,977	31,334	59,522	22,381	4,869	2,960
May	393,163	256,219	46,100	33,416	60,550	28,827	12,050	7,406
June	376,882	289,011	40,550	34,230	57,500	33,857	13,500	7,737
July	327,102	246,607	31,600	29,116	43,000	28,100	9,570	7,030
August	340,000	272,589	37,770	32,814	50,460	36,754	8,800	10,096

Factory shipments for the other months of 1921 and 1922 and output for 1922 follow:

	Output	Carloads		Driveaways		Boat	
	1922	1921	1922	1921	1922	1921	1922
September	206,849	19,002	25,950	13,840	30,055	2,959	8,002
October	237,611	17,808	26,980	12,971	33,320	2,226	7,040
November	236,887	14,264	27,232	10,528	27,376	1,402	5,070
December	227,319	12,100	26,900	7,500	27,500	134	1,300

Motor vehicle production segregated as to cars and trucks is as follows:

	1922			1922	
	Cars	Trucks		Cars	Trucks
January	81,693	9,416	November	215,284	21,603
February	109,171	13,195	December	207,269	20,050
March	152,959	19,761			
April	197,216	22,342	January	223,706	19,398
May	232,431	23,788	February	254,650	21,817
June	263,027	25,984	March	319,638	34,681
July	224,770	21,837	April	344,474	37,527
August	248,122	25,467	May	350,180	43,012
September	187,661	19,188	June	337,143	40,616
October	216,099	21,512	July	297,104	29,998
			*August	313,933	34,800

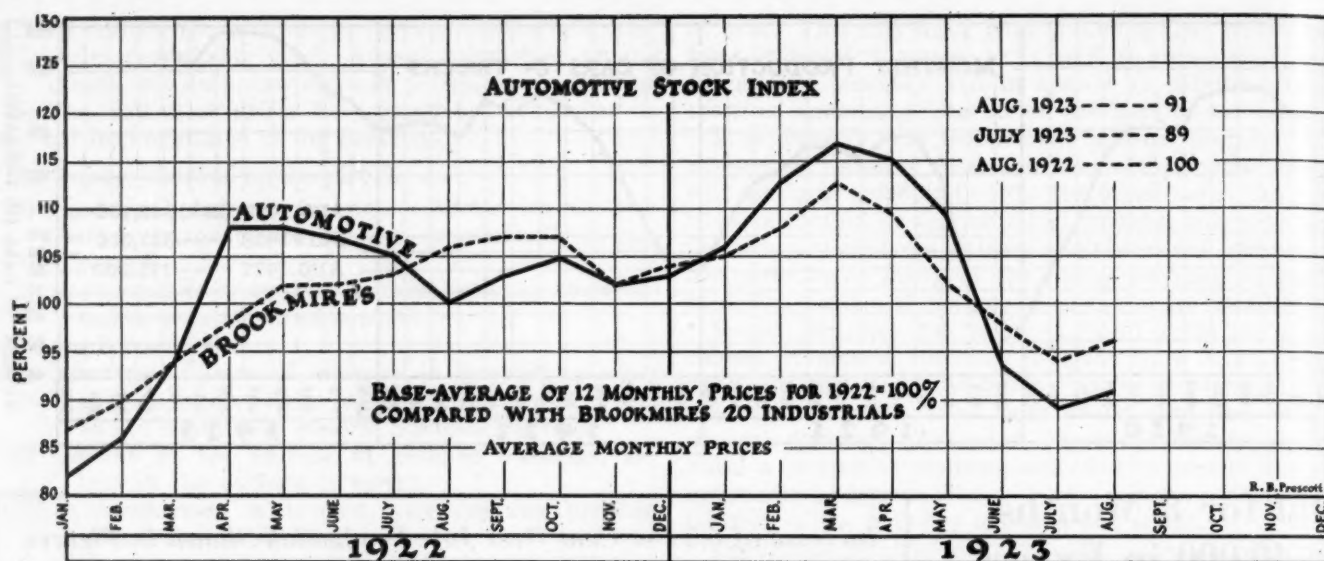
*Estimated.

652. Even if the industry turns out only the same number as it did in September, October, November and December, 1922, which was 1,149,698, the final figures would be 3,851,469.

Allowing for 10 per cent being trucks, which is a conservative estimate, it

would appear that the passenger car production in itself would exceed any previous best for both cars and trucks by a wide margin. This would mean at least 3,600,000 passenger cars, whereas last year the passenger car count was 2,406,396.

AUTOMOTIVE STOCKS MOVE UPWARD



Exchange Quotations Show Forward Movement of Stocks

New York Exchange

	Aug. 7	Sept. 1
Ajax Rubber	5 1/2	7 3/8
American Bosch	30 1/2	36 1/2
American La France	10 3/8	11 1/4
American La France pfd.	95	95
Case, J. I.	33	32
Case, J. I., pfd.	68	65
Chandler	47	53
Continental Motors	7 1/4	7 1/4
Eaton Axle & Spring	23 1/2	25 1/2
Electric Storage Battery	54	61
Emerson-Brantingham	1 1/2	1 1/2
Emerson-Brantingham pfd.	6	6 1/2
Fisher Body	152	170
Fisher Body of Ohio	98 1/2	98 1/2
Fisk Tire	7 1/2	8 1/4
Gardner Motor	7 1/2	7 3/4
General Motors	13 3/4	15 1/8
General Motors pfd.	79 1/2	81
General Motors 6%	78	81 1/2
General Motors 7%	95	96
Goodrich, B. F.	20 1/4	25
Goodrich, B. F. pfd.	78 1/2	81
Goodyear Tire pfd.	44 1/2	45 1/2
Goodyear Tire pr. pfd.	92	91 1/2
Gray & Davis	7 1/2	9
Hayes Wheel	33 1/4	37 1/2
Hendee Mfg.	12 1/8	17 3/8
Hudson	22	26 1/2
Hupp	18 1/4	20 1/4
Inter. Harvester	72 1/4	74 1/2
Inter. Harvester pfd.	108 3/4	104 1/2
Kelly-S Tire	30	33 3/8
Kelly-S Tire 6% pfd.	78	80
Kelly-S Tire 8% pfd.	95	90
Kelsey Wheel	95 1/2	95
Kelsey Wheel pfd.	97	97
Keystone Tire	4 1/4	4 7/8
Lee Rubber	18 1/4	18 1/2
Mack Truck	70	80 1/2
Mack Truck 1st pfd.	93	93
Mack Truck 2nd pfd.	80	84
Marlin-Rockwell	7 1/4	7
Martin-Parry	26 1/2	30 1/4
Maxwell Motors A	37 1/2	43 1/2
Maxwell Motors B	11 3/4	13 1/4
Moon Motors	21	24 1/2
Mullins Body	12	18 7/8

Mullins Body pfd.	90 1/4	88 1/8
Nash Motors	91 1/2	92
Nash Motors pfd. A	97 1/2	97 1/2
Ohio Body & Blower	4 3/4	4 1/2
Packard	12 1/2	13
Packard pfd.	93 1/2	92 1/4
Parish & Bingham	9 1/8	11
Pierce-Arrow	7 3/8	9 1/2
Pierce-Arrow pfd.	17 3/4	23
Pierce-Arrow pr. pfd.	62 1/4	64
Reynolds Spring	18 1/2	20 5/8
Spicer Mfg.	13 3/4	13 3/4
Spicer Mfg. pfd.	89	90
Stewart-Warner	83 1/2	90 1/4
Stromberg Carburetor	63 3/4	70 1/2
Studebaker	101 1/8	106
Studebaker pfd.	115	113 1/4
Timken Roller Bearing	36 3/8	38 1/4
U. S. Rubber	37 3/4	42 1/4
U. S. Rubber 1st pfd.	90	96
White Motor	47	50 5/8
Willys-Overland	7 1/8	7 3/8
Willys-Overland pfd.	65 1/2	69 3/8
Wright Aero	9 1/2	9 3/4

New York Curb

	Aug. 7	Sept. 1
Aluminum Manufactures	22 1/4	21 1/4
Cleveland Motors	26 1/2	28
Durant Motors	42	39 3/4
Durant Motors of Ind.	10 1/4	9 3/4
Firestone Tire	84	84
Ford of Canada	410	410
Goodyear Tire	10 1/8	10 1/8
Motor Wheel	11 1/4	9 1/2
National Motors	1 1/2	1
Paige-Detroit	19 1/2	19 1/2
Peerless Motors	31	36
Reo	16 3/4	17 3/4
Roamer Motor Car	10 3/8	10
Stutz	14	13 1/2
Timken-D Axle	8	8 1/4
Timken-D Axle pfd.	83	83
Willys Corp. 1st pfd.	4	4

Philadelphia

	Aug. 7	Sept. 1
Electric Stor. Bat.	60 1/2	60 1/2

Chicago

	Aug. 7	Sept. 1
Bassick-Alemite	32	34 1/2
Borg & Beck	25 1/2	29 3/4
Chicago Coach	148	148
Chicago Coach pfd.	87	90
Continental Motors	7 1/8	7 3/8
Eaton Axle & Spring	25	25
Gill Mfg.	18 1/2	20
Hayes Wheel	34	38 1/4
Hupp	18 3/4	20 1/2
McQuay-Norris	19 3/4	19
McCord	34	34
Reo	16 7/8	17 7/8
Stewart-Warner	84 1/8	90 1/2
Yellow Mfg.	241	242

Cleveland

	Aug. 7	Sept. 1
Firestone	64	62
Firestone pfd.	81 1/4	82
Fisher Body of Ohio	98	98
Goodyear	10 1/8	10
Goodyear pfd.	44 1/4	45 1/2
Jordan pfd.	86	86
Peerless Motors	30 1/4	36
Stearns, F. B.	19 1/8	19 1/8
White Motor	47	47

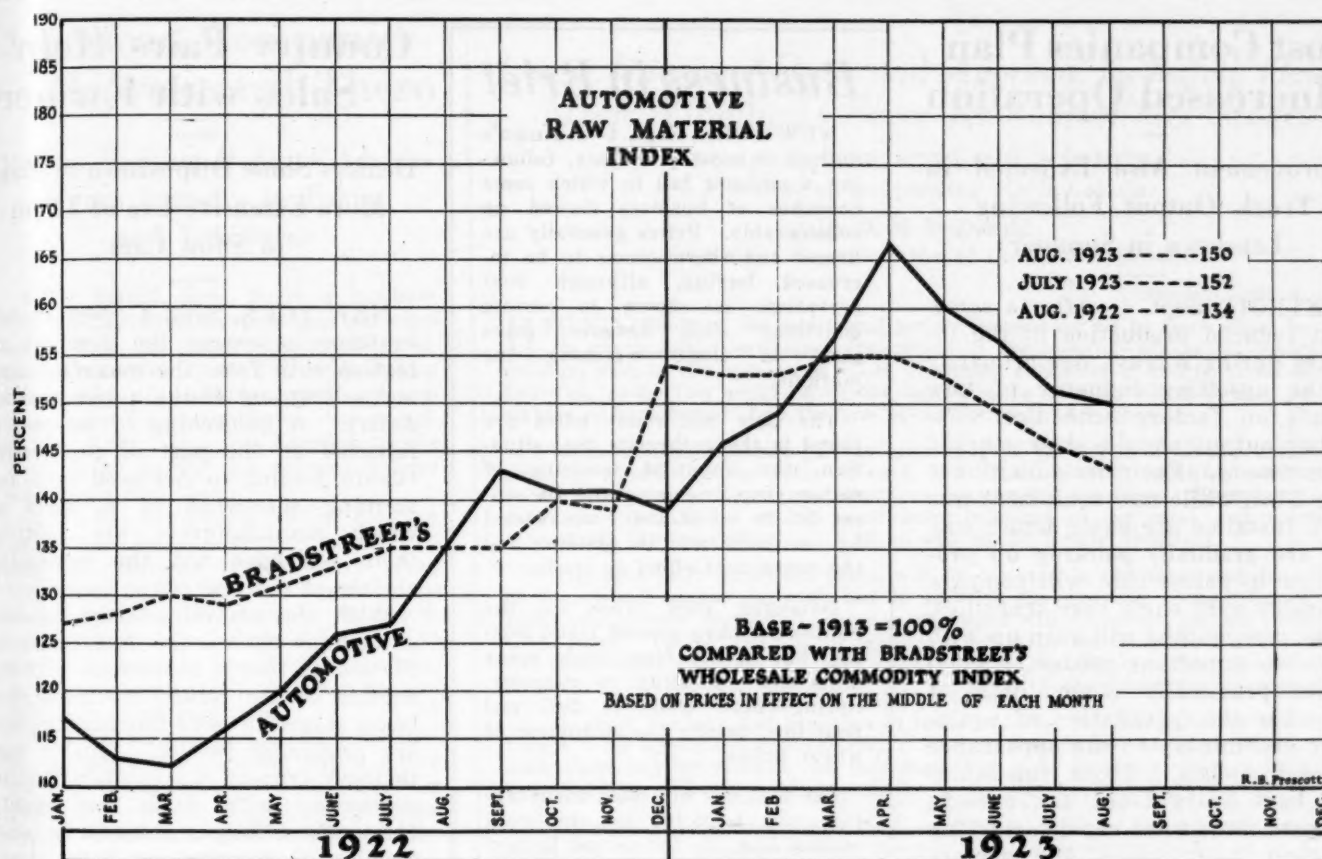
Detroit

	Aug. 7	Sept. 1
Continental	7 1/8	7 3/8
Edmunds & Jones	35	35
Ford of Canada	414	414
Motor Products	106	125
Motor Wheel	9 3/8	9 3/8
Packard com.	12 3/8	13 3/8
Packard pfd.	94	94 1/4
Paige	20	22 1/4
Reo	16 7/8	17 7/8
Timken-D Axle	8 1/4	8 1/4

Boston

	Aug. 7	Sept. 1
Gray & Davis	8 1/2	9 1/2
Greenfield Tap & Die	17	17
Hood Rubber	54	55

FURTHER DROP IN MATERIAL COSTS



Columbus, Dallas and Minneapolis Optimistic of Future

Columbus

COLUMBUS, OHIO, Sept. 4—A slight falling off in the demand for passenger cars is reported by dealers and distributors in Columbus and central Ohio. This is due partly to the season and also to the fact that business generally has slumped to a certain extent. But dealers are encouraged over the outlook for the fall months and have made preparations accordingly.

Farmers are coming into the market better as they have harvested good crops at fair prices and are thus willing to discuss the purchase of new cars. The automobile show at the Ohio State Fair was a means of stimulating business recently, and dealers secured a number of prospects there.

Closed models are still in the lead, dealers stating the demand is about 65 per cent closed to 35 per cent open. Cars selling from \$500 to \$1,800 are in the best demand, while those of higher price are also selling briskly.

New price lists announced during the month have had the effect of stimulating trade. Dealers are still having some difficulty in getting closed models in standard lines, although plenty of open models are available.

The used car situation is not good. Lower prices on some models have resulted in a glut in the used car market, and dealers are compelled to make still further reductions.

Dallas

DALLAS, TEX., Sept. 4—The outlook for the automotive business in Dallas and all Texas for the remainder of the year is excellent.

A \$500,000,000 cotton crop is being gathered and marketed in Texas now. Farmers and merchants are liquidating accounts, and bank deposits are increasing daily. Every one has money or will have shortly. The cotton crop is augmented daily by a million barrels of oil, the marketing of a good grain and the coming of a good rice and sugar cane crop. The entire State is stimulated by this combination, and automobile dealers are confident of the results.

The trade during July and August was all the dealers expected. September opened with increased sales and found the dealers ready to center energies on a sales campaign which is expected to clean up stocks of reconditioned cars and dispose of all the new models they can obtain.

Minneapolis

MINNEAPOLIS, Sept. 4—Optimism is perched on the northwest motor trade banner. Notwithstanding crop reports that are not entirely favorable, the dealers of the Ninth Federal district are expecting and are already finding improved business.

An indication is the fact that the annual first fall automobile and tractor show, Sept. 1-8, on the Minnesota State Fair Grounds, is the largest by far that ever has been held at the fair. It is a dealer show this year.

Conditions, agriculturally speaking, do not seem as bad as painted in the press. Farm produce is selling this year 13 to 14 per cent higher than last year. Oats and corn are 25 per cent higher. Dairy products sell higher. The wheat crop is not good, but in Minnesota wheat is only 6 per cent of the income production of the State.

In the country, however, the best trade just now is from professional and business men. The closed car selling at moderate price has the call. Dealers are not having the old time trouble financing their orders with the banks. (Conditions in other cities on pages 504 and 505)

PLANTS READY FOR BIG SEPTEMBER

Most Companies Plan Increased Operation

Improvement Also Expected in Truck Output Following Let-down in Summer

DETROIT, Sept. 4—After a somewhat reduced production in the industry during August, due primarily to the upsetting influence of new models on factory schedules, September output should show marked improvement. Factories which have been down while new equipment was being installed are again under way and are gradually working up production to points that will compare favorably with early year schedules.

The new months will open up with only two important producing companies practically down, both of these for the installation of equipment preliminary to the appearance of new models. Those companies that have brought out new cars in the past month are rapidly working up their daily totals and declare ample business in sight for the next sixty days to warrant capacity operation. Several companies which have not introduced new models have made price reductions which are expected to have a similar effect on sales.

Ford Did Not Reach 180,000

Ford's anticipated 180,000 production in August was not realized owing to the presentation of the re-designed car, but that figure has been set for September. Daily output during the month is expected to adhere closely to 7000. Chevrolet's schedule continues at the approximate 2000 daily figure and Gray and Star will maintain operations at about the 300 and 150 daily, respectively, thus following production marks of the past several months.

Buick production in September will run in excess of 650 daily with gradual increases to the 800 mark. Studebaker and Dodge Brothers are speeding up and should approximate the 600 and 1000 daily marks respectively before the month ends. The Essex plant is undergoing changes which will cut Hudson-Essex totals in the month. Hupp is aiming at the 200 daily mark and Paige-Jewett will continue at about this figure during the month.

Oakland is in production on its new models and will be ready for capacity operation of 300 daily during September. Oldsmobile is in nominal operation and will not get under way until late in the

Business in Brief

NEW YORK, Sept. 4—Autumn's outlook is most promising, following a summer lull in which some branches of business slowed up considerably. Prices generally are firmer and there seems to be increased buying, although conservatism is shown in certain quarters. Fall, however, looks good to those watching the markets.

The only discordant notes are found in the anthracite coal situation, the apparent lowering of cotton crop prospects and the upset in the oil industry occasioned by the price war in gasoline and the consequent effect on crude.

Damaged corn crops in the Southwest have slowed trade buying, but in the flour trade many mills are operating to capacity. Spring-wheat trade is dull and flour low, despite the steadiness of wheat prices.

Car loadings are most encouraging, with 1,035,741 for the week ending Aug. 18, the second largest total ever recorded, and an increase of 62,579 over the preceding week.

The railroads report heavy business, having handled 30,999,244 loaded cars of revenue freight from July 1 to Aug. 18, which is 5,195,251 better than the same period last year. Grain loadings have increased and the movement of coal and miscellaneous freight is heavy.

Bank clearings for the week ended Aug. 30 were \$5,525,847,000, a loss of 8.2 per cent from the preceding week and of 1.9 per cent for the corresponding period last year. Bank debits decreased 7.2 per cent from the preceding week and 3.1 per cent over the same week a year ago.

Stocks were more active and higher, with bonds irregular, money firmer and exchanges heavy.

month. Reo is at capacity and is approximating 150 daily, cars and speed-wagons. Rickenbacker production is approximating 50 daily. Maxwell-Chalmers at the new prices looks for increased operation during September.

Columbia is operating at about 50 daily and Dort is running along at about

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Country Fairs Help Sales with Farmers

Dealers Show Disposition to Make More Extensive Use of Them to Show Cars

NEW YORK, Sept. 4—New models continue to occupy the greatest attention both from the manufacturing and selling end of the automotive industry. A quickening of interest is reported on the part of prospective buyers, leading to increased sales and forming somewhat of a basis on which manufacturers are plotting their schedules for the remaining months of the year.

With the arrival of new models, automobile shows, the forerunner of the season that is ushered in with the holding of the New York Show, are being staged in some communities and are producing results. This is particularly true of the exhibits held in connection with State and county fairs, where farmer interest in automobiles is reported as being keen. These rural shows are productive of sales and bring out good prospects.

Going After Farmer Trade

Dealers are showing an increasing disposition toward utilizing the country fair as a means of arousing farmer interest in automotive products to a high point and this fall doubtless will see a greater number of motor vehicle exhibits in conjunction with such fairs than in past years. Producers early in the year anticipated that the farmer would offer the best prospect in the period when sales were on the decline in commercial centers, and they are now extending their full facilities to realize on this anticipation.

Conservatism on the part of motor vehicle producers is shown by the report that commitments for parts are not extending, for the most part, much beyond October. This is not indicative of any fear of a slump in purchasing during the rest of the year but shows rather that manufacturers prefer to move cautiously until exact conditions are apparent.

While many car producers experienced a lull in operations during August, there were some among the major manufacturers who maintained consistently high schedules. These

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INDUSTRY AFFECTED BY JAPAN QUAKE.

American Companies Represented There

Makers Waiting Definite Advices
From Agencies in Tokio
and Yokohama

NEW YORK, Sept. 5—In a business way the Japanese disaster does not seriously affect the automobile industry, although a number of the big car manufacturers who are seeking export connections have been developing the possibilities of the Nipponese Kingdom, while some of the leading tire companies have been doing well there.

Japan has not been a fruitful field for automobile manufacturers, largely because of the poor roads, there being fewer than 10,000 cars and trucks in operation in the entire country. Moreover, the high price of gasoline—from 65 to 85 cents—discouraged the thrifty Japanese, so that many found it cheaper to hire their cars than own them.

A good roads program had been prepared before the disaster which called for the expenditure of \$135,000,000 in thirty years in six of the leading cities, which would have greatly widened the automobile market.

Few Manufacturing Plants

With three exceptions, all the automotive establishments in Japan were local sales, service or body building plants. The exceptions were the Yokohama and the Dunlop tire manufacturing plants and the Ford assembling plant maintained by Sale & Frazar, distributor of the Ford in Japan, all of these being located in Yokohama and presumably destroyed.

The Yokohama Rubber Co. is owned jointly by a group of Japanese capitalists and the B. F. Goodrich Co. of Akron. The Dunlop plant is a branch of the English company and is reported to have had an organization of 500 employees at one time. Several other rubber companies have been organized, but the industrial depression forced some or all of them to cease operations. Body building plants were numerous both in Tokio and Yokohama, but it is believed that all of them were owned locally.

The assembly plant at Yokohama was erected about three years ago. It received cars and trucks in a partially disassembled state and prepared them for use. The capacity was about fifty vehicles a day, the recent rate of actual production having been about ten.

Three Americans were employed in the plant, which was under the management of K. Lewis, who has been in Yokohama for about three years. Eight or ten Americans in all were employed by Sale & Frazar, although some of these were

Lower Insurance Rates and Approval by Safety Heads Mean Winning of Favor for Four-Wheel Brakes

AN INTERVIEW WITH G. H. HANNUM,
President of the Oakland Motor Car Co.

By D. M. McDonald,
Detroit News Representative of the Class Journal Co.

Detroit, Sept. 4.

RECOGNITION of the additional safety factors set up by four-wheel brakes on automobiles, expressed concretely in the creation of special insurance ratings, will, in the opinion of G. H. Hannum, president of the Oakland Motor Car Co., cause the adoption in the near future of four-wheel brakes on all classes of cars better than the low priced four-cylinder lines.

Manufacturers cannot fail to take heed of the effect of lower insurance rates in promoting the sales of cars, Mr. Hannum said, touching as it does on one of the most important considerations in the purchase. High insurance rates have long had a certain restraining influence on car sales, and anything that tends toward reduction of these will obtain public approval.

The fact that insurance rates will be lowered is the most definite effect of four-wheel brakes, he said, but in addition the growing recognition of the additional safety that lies in cars so equipped will cause the buying public to seek them. Police and public safety officials in many cities already have endorsed them and this in itself would cause a steadily growing public sentiment in their favor even without the espousal of the insurance companies.

A good, healthy fall business is looked for by Mr. Hannum for manufacturers who operate conservatively. The market is not such as to warrant wide-open buying policies, he indicated, but it is rather a market in which manufacturers should hold inventories to a minimum and keep moving.

Automobile manufacturers have nothing to fear in the general business situation of the country if they operate on a conservative basis, he declared.

Closed cars undoubtedly will continue to improve their position in the industry's output, Mr. Hannum asserted, and he said that according to present buying trends the time is not far distant when open cars will cost more than closed. He based this on the fact that general production of factories will be closed cars and that open models will become the occasional product and for that reason will have to bear the cost of interference with the regular run.

Until such time as the industry is placed on what might be termed a closed car basis, Mr. Hannum saw increasing possibilities for the sale of open models equipped with specially designed curtains or panels capable of rapid adjustment. Open car buyers are not oblivious to the protective advantages of closed models but are influenced largely by the price differential as now existing into continuing to buy the lower priced types. Manufacturers who offer the adaptable open models should find a quickened appreciation.

Farm buying generally, according to Mr. Hannum, has been mostly in the low priced lines, and to a large extent has been only by farmers who had to have them. The principal difficulty with the farm market, he said, is that the farmers have had a chip on their shoulders and probably will not take their rightful place in composite business until their attitude is improved. West of the Mississippi there has been much better feeling among farmers, he said, and consequently there has been much better automobile business.

connected with other activities of the company.

Officials at New York estimate that probably 5000 or 6000 Ford vehicles were in service in the two cities, with from twelve to fifteen agencies selling Fords. Sale & Frazar also represented Hupmobile, Franklin and White in Japan.

The General Motors Export Co. is represented in Japan by A. B. Paddock, with headquarters in Yokohama. Paddock today cabled the company from Kobe saying he was safe. Paddock took his post last March.

C. Yanase, who is the sales distributor for the General Motors lines, with headquarters in Tokio, now is en route from England to New York and is expected here Saturday. He is accompanied by his wife, but his family is in Japan. The company which he heads maintains an extensive establishment in Tokio, the organization numbering from 200 to 300, with garages, service stations and body building plant. Several hundred Chevrolet, Cadillac and GMC units are shipped to Japan each year. No plans as to future activities will be con-

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Taxes in Wisconsin May Drive Out Nash

Conditions in State Burdensome
—South Bend and Other
Cities Want Plant

KENOSHA, WIS., Sept. 5—A possibility that Nash Motors Co. may find it expedient to move its factories from Wisconsin was expressed today by Nash officials, following a report that the company was considering locating in South Bend, Ind.

It was intimated that South Bend has made overtures to the Nash company, and that W. H. Alford, vice-president of the Nash company, went to South Bend to look over the situation. So far the Nash officials have not entered into negotiations with South Bend, it was said, and it was added that the company had no present plans for moving away from Wisconsin.

It is known, however, that for some time the various taxes to which industrial concerns are subjected in Wisconsin have been considered burdensome by the Nash interests. In a statement today, C. W. Nash, president of the company, said:

C. W. Nash Tells of Status

With conditions in Wisconsin as they are now we must have an anchor to the windward. We must have something in view if Wisconsin conditions make it impossible or uneconomical for us to continue manufacture. You know these conditions as well as we do. They may force us to seek some new field, and there are plenty of fields open.

There are several progressive cities which would be pleased to make concessions to secure the location of the Nash plants. I am not ready to say that South Bend has made any such offer, but there are several cities which have assured us a plant if we will move to them.

We have no present plans for moving away from Wisconsin, but we are closely watching the situation in Wisconsin, and that is about all I would want to say. We have not dickered with the city of South Bend, but it is true Mr. Alford was there and looked the town over.

Nash Speaks to Dealers

MILWAUKEE, Sept. 4—All precedent has gone by the board, all accepted theories are being shattered by the tremendous volume of sales by the automotive industries of America during August, a condition that doubtless will proceed through September, in the opinion of Charles W. Nash, president of Nash Motors Co., Kenosha, Wis., expressed before the distributors and dealers of Wisconsin and northern Michigan at the semi-annual conference held in Milwaukee during State Fair Week.

"It is difficult to account for the fact that this year the public has been buying as many cars in August as in June and July," Nash said. "August usually is a 'low' month in this business. According to all traditions, there should have been a marked falling off in August.

"Yet our company sold more cars in the month than it did in July, and indications are that more will be sold in September than in August. This applies to the industry in general. Only once before, in 1920, was there a similar excess in sales volume during the late summer months.

"A remarkable fact is that farmers, who are supposed to have been hard hit by poor crops or low prices, are buying our cars. It is probably one more proof that the motor car has become a real necessity and is not a luxury in modern life."

Nash said business conditions in general throughout the country were never better than at present, with bright prospects for the future.

He told Nash dealers that the present day trend in motor car manufacture should be toward standardization of body line and general appearance. He said that a man who buys a car today should be in less danger than formerly of having his car rendered antique in appearance in almost a day by radical changes and departures in body design.

Nash shipments from Jan. 1 to Aug. 15, this year, were reported to have been in excess of those made in the entire calendar year of 1922.

Carrell Takes Appleby's Place with Erd Motors

SAGINAW, MICH., Sept. 4—W. A. Carrell, former vice-president and general manager, has succeeded the late Benjamin G. Appleby as president of the Erd Motors Corp. Mr. Appleby died Aug. 14 after an illness of several months.

Carrell was at one time general manager of Supreme Motors Corp. and during the last ten years has been associated in an executive and engineering capacity with the Wisconsin Motor Co., the Beaver Motor Co. and the International Harvester Co.

The Erd Motors Corp., which was established in 1908, has been entirely reorganized with a capitalization of \$300,000, and expects to announce within a short time a new complete line of marine, industrial truck and tractor motors.

Stockholders Support Move to Buy Gillette

APPLETON, WIS., Sept. 4—The stockholders' executive committee, which is attempting to reorganize the Gillette Rubber Co. of Eau Claire, Wis., now in charge of a creditors' committee, met at the office of Dr. D. S. Funnels in Appleton, Wis., and arranged to raise adequate funds for the acquisition of the entire property by purchase.

The committee has been at work for nearly a year and reported that it has gained genuine support from the stockholders in the movement to provide funds needed for a complete financial reorganization. The plant has been in continuous operation and has been working at full capacity all of this year on domestic and foreign orders for Gillette products.

Mengel Plant Ready to Start Production

Will Turn Out 500 Bodies Daily
at Beginning, as Well as
Parts for Bodies

LOUISVILLE, KY., Aug. 31.—Construction of the \$1,000,000 plant of the Mengel Body Co., which will make commercial automobile bodies for the Ford, Star, Chevrolet and Overland automobiles, has been completed, machinery installed and formal opening has been set for Sept. 1.

Starting with a production of about 500 automobile bodies a day and employment of about 500 workers, in addition to turning out thousands of parts for automobile bodies for shipment to other cities for assembling, production will be increased from time to time and more workers employed, according to William Hoge, vice-president of the company.

The new plant, which will be the largest of its kind in Kentucky, and one of the largest in the country, will send its output to all parts of the country, Hoge says. The plant itself, involving two one-story brick buildings, each about 273 ft. by 440 ft., is located on a plot of sixteen acres at Fourth and G Streets. The buildings and land cost the company approximately \$1,000,000, Hoge states, while modern machinery has been installed at a cost of \$250,000.

Plan for Unloading Lumber

According to the general plan of operation, lumber will be unloaded on a platform from an extension of the Southern Railroad in front of the plant, carried through the dry kilns by trucks, thence through the dry storage department to the main part of the plant, where it will be made into bodies or body parts and then carried out the rear to the loading platform ready for shipment.

Bodies will be shipped to automobile plants in Michigan and to New York, New Jersey, southern States and west as far as California.

The factory takes its place as having a floor space among the largest in the country.

John T. White has been chosen as superintendent of the plant.

\$23,244 Surplus in 1923 Reported by Power Truck

ST. LOUIS, Sept. 4—An audit of the books of the Power Truck & Tractor Co., read to a meeting of the stockholders by President P. G. Craven, showed that the company was operated at a loss of \$4,666 for its first seventeen months, ending in 1919.

In 1920 there was a net profit of \$1,521; in 1921, a deficit of \$35,571, and in 1922, a loss of \$7,388.

For the first six months of this year there was shown a surplus of \$23,244.

Boston Makes Plans to Greet M. A. M. A.

While Members Are Busy at Convention, Wives Will Be Shown Historic Places

BOSTON, Sept. 5—When the members of the Motor and Accessory Manufacturers Association meet in Boston Sept. 19, 20 and 21 they will be entertained in a way to make them all remember their trip. This is particularly true of the program for the women.

A short time ago M. L. Heminway, general manager, picked out a committee to handle the affair, this committee being made up as follows: Fred T. Moore, chairman, branch manager of the B. F. Goodrich Co.; J. P. Hach of L. C. Chase Co., W. M. Lorenz, manager Willard Battery branch; H. K. Johnson of the F. S. Carr Co.; B. J. Moses, treasurer Gray & Davis Co., and James T. Sullivan, automobile editor of the *Boston Globe*.

This committee interviewed Mayor James M. Curley of Boston, who promised that he would not only speak at the opening session if he were in Boston, but would aid in the entertainment. Moore and Sullivan live near the Mayor at Nantasket and know him intimately, so a few days ago he asked them to bring the committee to City Hall for a conference, after which he directed one of his secretaries to do whatever was necessary to make the visit a success.

Sight-Seeing Trips Arranged

The annual banquet this year promises to be a real delightful affair. A steamer will take the party—men and women—down Boston Harbor where they can get a view of historic points. In a large dining room at Pemberton Inn in the town of Hull the party will enjoy a shore dinner, with vaudeville and dancing throughout the evening, returning home on the boat when they please. Another trip mapped out for the women will take them to Lexington and Concord. This will be on Friday and the trip will not be a rush one. The women will also be taken on a sightseeing trip around Boston.

Ford Los Angeles Branch Will Start on 200 Daily

DETROIT, Sept. 4—New construction at the Ford Los Angeles assembly branch has increased capacity to 200 daily on which schedule the branch will start as soon as all new equipment is installed.

Assembly at the present time is at the rate of 100 daily. The Los Angeles branch since the war has been devoted principally to manufacturing bodies and upholstery for the other Ford plants on the coast. This will be continued in addition to the assembly work.

New body ovens at the plant will have capacity for sixty closed and 100 open bodies every eight hours. New enamel-

ing ovens are also being added to take care of the entire branch production. Closed bodies will be furnished for the San Francisco branch territory. Eleven hundred men will be employed.

The Ford Northville plant in the Detroit territory is now turning out 85,000 car and truck valves and 10,000 tractor valves daily, employing 350 men, working three eight hour shifts. The Hamilton plant of the company is now producing wheels in excess of 8500 daily, setting a record of 8684, Aug. 2, in the sixteen hour daily period.

Standard to Keep Price at 16 Cents in Dakota

CHICAGO, Sept. 4—Following a conference between Governor McMaster of South Dakota and Robert W. Stewart, chairman of the board of the Standard Oil Co. of Indiana, it was announced that gasoline in South Dakota will remain at 16 cents.

The governor took the full responsibility for the situation and said that he expected to be attacked by the independent interests for making such a decision. Inasmuch as the independents had made no move for a reduction prior to his action, he declares they have no cause for complaint.

The decision of Standard Oil of Indiana to leave the price at 16 cents in the Northwest is interpreted to mean a continuation of the price-cutting war, with the idea of stamping out the competition of the independents.

A. A. A. to Petition for Gasoline Survey

Will Ask Congress to Act on Conditions Surrounding Price Situation

WASHINGTON, Sept. 4—The American Automobile Association will ask the next Congress immediately upon convening, to investigate thoroughly the conditions surrounding the price of gasoline to the ultimate consumer.

The association believes that "suspicion regarding the conduct of an industry which affects directly 60 per cent of the total population and indirectly every man, woman and child in the United States is an unhealthy condition, which, if continued, cannot help but retard the development of motor vehicle transportation."

Thomas P. Henry, president of the A. A. A., declares that an investigation is necessary. He says:

The request for a Federal investigation of the gasoline price situation made by the American Automobile Association does not necessarily mean Federal regulation. The A. A. A. feels that the present laws and agencies are adequate to handle the situation when the real facts are disclosed. However, should the facts warrant the further strengthening of existing agencies, it can then be determined by those fighting for a reasonable price on gasoline, just how far they desire to advocate Federal regulation.

Boston Committee in Charge of M. A. M. A. Convention



Kneeling, left to right, H. K. Johnson of the F. S. Carr Co., B. J. Moses of Gray & Davis; standing, left to right, W. M. Lorenz, branch manager of the Willard Battery Co.; Fred T. Moore (chairman), branch manager of the B. F. Goodrich Co.; James T. Sullivan, automobile editor of the *Boston Globe*, and John P. Hach, traffic manager of the L. C. Chase Co.

Parts Maker Wants End of Receivership

**American Bronze, Subsidiary of
Dollings, Declares Its Con-
dition to Be Good**

PHILADELPHIA, Sept. 5—The American Bronze Corp. of Berwyn, which is a subsidiary of the R. L. Dollings Co., and of which E. G. Anderson is president, has filed in the Chester County Court a petition requesting that the receivership granted July 25 be vacated.

The claim is made that the company is solvent, that it has many orders on its books and that the plant at the present time is operating at normal capacity. Because of all of this, it is believed that control of affairs will be returned to Anderson this fall.

The American Bronze Corp. was involved when the R. L. Dollings Co. experienced financial difficulties in July which brought about the appointment of a receiver for the Columbus concern, which had been doing a big investment banking business. Immediately following this, bankruptcy proceedings were brought against the Pennsylvania subsidiaries of the Dollings company, of which the American Bronze Corp. was one.

Anderson was in California at the time and unaware of the troubles of the holding company or the appointment of a receiver for his own concern. When he learned of the situation he returned home and immediately took steps to have the receiver discharged.

Had Contracts Exceeding \$60,000

When the receivership was granted, the company claims, there were on hand contracts for its manufactured products in excess of \$60,000. It denies the claim that it had raw material on hand sufficient for only a few days' operation and that it had neither cash nor credit to enable it to obtain additional material.

The company was entirely solvent, according to the petition filed at the time the original proceedings were brought, and all obligations would have been met when due had the receivership not been granted.

Authority Asked to Sell Last of Standard Parts

CLEVELAND, Sept. 5—That the \$20,000,000 Standard Parts Co. soon will be wound up after a long receivership was indicated here when A. V. Cannon, attorney for the receiver, filed application for authority to sell the last remaining plant unit of the corporation—the Standard Welding Co.—in parcels. The sale will include valuable machinery in the plant, office furniture and fixtures if Federal Judge Westenhaver approves the application as he is likely to do.

The receiver reports that another dividend will be paid to creditors before the

corporation is finally terminated. Creditors to date have been paid dividends that aggregate 65 per cent of their claims, or approximately \$6,500,000. It is estimated that the proceeds from the sale of the remaining property will increase the payments to 75 per cent of claims and possibly 85 per cent.

The Standard Welding Co. building in this city is the only remaining structure to be sold. The common stock of the Bock Bearing Co. at Toledo and some miscellaneous accounts are all that remain of the Standard Parts.

Willys-Overland Board Has Three New Members

TOLEDO, Sept. 5—The board of directors of the Willys-Overland Co. was reorganized today by the election of C. O. Miniger, J. E. Kepperley and Thomas H. Tracy and acceptance of the resignations of Henry L. Thompson, chairman of the board; W. W. Knight, F. A. Judson, Charles E. Bunting and George L. Heater, all of whom have represented bank creditor interests for the last two years.

Miniger and Rathbun Fuller will succeed Thompson and Knight as members of the executive committee.

J. H. Gerkens, treasurer, and Linwood A. Miller, secretary, were elected vice-presidents. Two places on the board remain vacant. President Willys, Gordon Mather and George M. Jones are the holdover members of the board of directors.

No action was taken on the issuance of any of the \$15,000,000 authorized bond issue. It is understood that the business of the company is in such a condition now that further financing by bonds may be unnecessary.

It was rumored earlier in the week that \$10,000,000 of the bonds would be issued to improve the cash position of the company and insure it against any setback in business.

Studebaker Corp. Built 15,700 Cars in August

SOUTH BEND, IND., Sept. 4—No slowing in production in August was experienced by the Studebaker Corp., according to President A. R. Erskine, who announces that with 15,700 turned out last month the total for the eight months ended Aug. 31 was 110,540 cars. This is more than were manufactured all of last year, when the total was 109,222. For the first eight months of 1922 the count was 78,369.

"Sales are absorbing production, totaling about 30,000 cars for the first two months of the current quarter, compared with 30,199 for the full third quarter last year," Erskine says. "The total stock of cars in dealers' hands is less than it was last May, and the indicated fall demand is strong. The total sales of the last four months will be all gain as compared with last year. The management expects sales to top 150,000 cars this year, as against 110,269 last year."

\$597,339,236 Shown to Be Ford's Assets

**Cash Given as \$230,811,918 in
Company's Balance Sheet as
of June 30, 1923**

DETROIT, Sept. 5—Total assets of \$597,339,236, including cash, trade-marks and good-will of \$230,811,918 and merchandise and supplies of \$107,609,419, are reported in the balance sheet of the Ford Motor Co. as of June 30, 1923. At that time capital stock outstanding was \$17,264,500 and profit and loss surplus, \$414,129,158.

The report as of June 30, 1922, showed total assets of \$409,820,133, including \$145,985,669 cash, \$20,517,986 good-will and \$56,045,121 merchandise and supplies. Profit and loss surplus was \$289,935,296 and capital stock, \$17,264,500.

The balance sheet as of June 30, 1923, compares with that of the same date of the previous year as follows:

ASSETS		
	1923	1922
Cash	\$230,811,918	\$145,985,669
Accounts receivable.....		47,255,625
Securities	37,170,489	18,383,310
Notes receivable.....		79,574
Real estate, equip- ment, etc.....	221,241,324	121,157,094
Merchandise and sup- plies	107,609,419	56,045,121
Prepaid expenses.....	506,086	395,754
Good will.....		20,517,986
Total	\$597,339,236	\$409,820,133
LIABILITIES		
	1923	1922
Accounts payable.....	\$ 52,472,217	\$ 42,307,570
Employees' investment	17,164,351	11,903,500
Accrued expenses.....	1,047,834	1,276,803
Reserve depreciation.	62,015,847
Tax reserve.....	33,245,329	47,132,464
Capital stock.....	17,264,500	17,264,500
Surplus	414,129,158	289,935,296
Total	\$597,339,236	\$409,820,133

Analyzing the latest balance sheet, Dow, Jones & Co. make deductions as follows:

1,833,812 Ford Products

During the year ended June 30, 1923, Ford produced 1,833,812 cars, trucks, tractors and Lincolns. The increase in surplus over June 30, 1923, was \$124,192,862. After deducting \$25,000,000 estimated profits from the parts business and \$20,000,000 estimated "other income," manufacturing profits were \$79,192,000—or at the rate of \$43.32 per vehicle produced.

During the preceding twelve months surplus increased \$133,248,000 and after deducting \$20,000,000 parts profits and \$15,000,000 "other income," there remained \$98,248,000 as manufacturing profits. The output for that twelve-month period was 1,080,000 vehicles, making the profit per car \$90.97.

Gross profits for the June 30, 1923 year were probably \$160,000,000, compared with \$190,000,000 the preceding twelve months. This is arrived at by taking the \$124,192,862 increase in surplus and adding \$33,245,329 reserve for taxes and estimated \$2,000,000 increase in the depreciation reserve account.

Overland's Delivery Car Known as "Spad"

Chassis Identical With That of Model 91 But Bodies Are Designed by Company

TOLEDO, Sept. 5—Spad is the name selected for the Overland delivery car, which will be in the hands of dealers some time this month. The letters stand for "speed, power and durability." The chassis will be identical with the present Model 91 chassis, but the bodies will be Overland designed and will include several types.

There will be 68 in. of loading space back of the driver's seat and a width of 44 in. inside. The express or panel types will measure 51 in. high at the sides and 51½ in. at the center.

The body sills, sub-sills, top rails, body posts, rafters and horn bars are hardwood. The joints are closely fitted and screwed, bolted or glued. The top and body are securely braced with wrought iron braces. A substantial spring lock fastens each vestibule door, the rear doors of the panel combination being equipped with both inside and outside locks. Three hinges hold each door securely to prevent sagging.

The seat cushions are of the divided type, allowing one side of the seat to be raised to give access to the tool and battery box. Full curtains of oil duck protect the sides and back of express combinations and are also provided at the sides of the open cab types. There are three lookout windows above the driver's seat in the closed division cab and a window in each of the rear doors of the panel combinations permit a rear view.

The body is finished in brushed lead and oil, eight coats of paint striped and finished with high grade finishing varnish. The flooring is of longleaf yellow pine and the roof is Tower brand black oil duck. The driver can get in or out from either side. A double ventilating windshield, lights, horn, starter and speedometer are standard equipment. Prices are to be announced later.

Firestone Steel Products Making New Line of Rims

AKRON, Sept. 4—The Firestone Steel Products Co. has brought out a new line of interchangeable truck rims, standardizing on four sizes—5, 6, 7 and 8 inch—so as to be interchangeable on the present 6-in. felloe.

The new rims, to be known as Type B, are being manufactured for 20-in. wheels in the 30 x 5, 32 x 6, 34 x 7 and 36 x 8 sizes, all of which will mount upon the standard 32 x 6 wood felloe band or steel felloe, using the same clamping ring, bolts, nuts and clamps.

Type B rims also are being made for 24-in. wheels in the 34 x 5, 36 x 6, 38 x 7 and 40 x 8 sizes, all of which fit the 36 x 6 wood or steel felloe.

Instead of the inside flange being integral with the rim base, Type B rims have been made with two removable side rings, facilitating removal of the tire by applying pressure from either side and permitting in case of injury the replacement of the ring only, instead of the complete rim, as now is necessary.

A high-carbon spring-locking rim has been provided which holds the tire securely and insures firm seating. The drive plates are of a heavy type to withstand extreme circumferential strains.

New Cleveland Has Body and Mechanical Changes

CLEVELAND, Sept. 4—A number of mechanical and body design changes have been made in the Cleveland line for 1924, principally in the ignition and valve mechanism. A new automatic spark advance is used on the Bosch system, making use of the hand advance lever unnecessary. The new system is used with a new type Bosch generator and starting motor.

A new type Stromberg carbureter is used in connection with an improved method of heating application to the intake manifold. A new valve actuating mechanism is also used, this having automatic lubricating pressure forcing oil from the main oil line to the valve rocker shaft. From there it is forced out by centrifugal force through a groove in the rocker arm to a felt oil retainer.

The prices of the new line are as follows: Phaeton, \$1,045; touring de luxe, \$1,145; roadster, \$1,085; sport model, \$1,295; two-door sedan, \$1,365; special two-door sedan, \$1,445; four-door sedan, \$1,545; special four-door sedan, \$1,645; coupe, \$1,245 and special coupe, \$1,345.

Coupe De Luxe Co. Shows New Body Model for Ford

ST. LOUIS, Sept. 4—The new 1924 model of the Coupé De Luxe body for Fords, manufactured by the Coupé De Luxe Co., has been exhibited to dealers of the West by George Smith, Jr., vice-president of the company.

The new body is different in many respects from the old. The seat is larger, the driver's seat has more room, there is a ventilator and the hood, shell and radiator are finished in a straight line instead of rounded.

The company is planning to establish subsidiary plants in the East. Bodies will be shipped from St. Louis without paint or upholstery.

TEMPLAR TO BE SOLD

CLEVELAND, Sept. 6—The \$3,000,000 plant of the Templar Motor Co., in this city, is to be sold to the highest bidder within thirty days. The sale will be made by the receiver, who has been operating the plant. The order for the sale was made today by Federal Judge D. C. Westenhaver. The Guardian Savings and Trust Co. has a \$1,000,000 mortgage on the plant, which is a first lien.

Overland Cuts Price of Phaeton to \$495

Red Bird Model Is Reduced to \$695—Other Types Affected by Decrease

TOLEDO, Sept. 5—Willys-Overland Co. announces price reductions ranging from \$30 to \$65 on the entire Overland line, effective today.

Following are the old and new prices:

MODEL 91		
	Old Price	New Price
Roadster	\$525	\$495
Phaeton	525	495
Coupe	795	750
Sedan	860	795
Chassis	425	395

MODEL 92		
	Old Price	New Price
Red Bird phaeton.....	\$750	\$695

Chevrolet Reduces List on Full Line of Models

FLINT, MICH., Sept. 4—The Chevrolet Motor Co. announces reductions in prices of all cars and commercial chassis, effective Sept. 1. The reductions range from \$20 on the roadster to \$65 on the sedan, and from \$25 to \$30 on the chassis.

The following table shows the latest schedule:

	Old Price	New Price
2-passenger roadster....	\$510	\$490
5-passenger phaeton....	525	495
3-passenger utility coupe	680	640
5-passenger sedan.....	860	795
Chassis	425	395
Light delivery.....	525	495
Utility express.....	575	550

The four-passenger sedanette, formerly listing at \$850, has been discontinued.

Peerless Lowers Prices on Nearly Its Full Line

CLEVELAND, Sept. 4—Effective Sept. 1, reductions in the prices of all models with the exception of the coupé-roadster have been made by the Peerless Motor Car Co. The reductions range from \$210 to \$300.

The old and new prices compare as follows:

	Old Price	New Price
4-passenger phaeton....	\$2,990	\$2,690
7-passenger phaeton....	2,990	2,750
2-passenger coupe-roadster	3,300	3,300
4-passenger town coupe..	3,600	3,390
5-passenger sedan.....	3,900	3,690
7-passenger sedan.....	4,090	3,840
7-passenger limousine...	4,390	4,090

EXIDE MAKER IN ST. LOUIS

ST. LOUIS, Sept. 5—The Electric Storage Battery Co. has purchased a site for a manufacturing plant on the east side of Vandeventer Avenue, south of Chouteau. Work will start at once. The building will also house the administrative offices of the St. Louis branch.

SOUTHERN OUTLOOK IS EXCELLENT

Atlanta

ATLANTA, Sept. 4—Automotive sales in Atlanta and the Southeast since the new models were announced and shown have experienced a remarkable increase, most of the distributors having sold their first quota of the new models and reporting orders in hand for early delivery that will serve to make September the biggest month of the year, and probably one of the biggest months in the history of the industry in this district.

There has been more interest evinced on the part of the public in the new models this year than ever before, and the salesrooms along Automobile Row have been virtually crowded every day since the new models were announced. Several distributors have adopted the policy of remaining open during the evenings for a temporary period.

So great have been the sales over the Southeast the past three or four weeks that dealers outside of Atlanta are practically "begging" the distributors for cars, and in many instances have made special trips to Atlanta for the purpose.

Birmingham

BIRMINGHAM, ALA., Sept. 4—The prospects for fall sales of automobiles in the Birmingham territory are excellent, despite the fact that the cotton crop at present is not particularly promising, and the manufacturing interests of the northern part of the State are facing a period when it will be determined whether they will be able to work full time or not.

The cotton crop is estimated by both Government and private reports at practically the same as during 1922, something over 800,000 bales. A higher price for cotton seems to be assured, however, which will more than make up for a slight loss in production and grade and a slightly higher cost of production.

The manufacturing interests of the State apparently are facing a light demand. Lumber has been suffering since May 1. Some of the iron companies have caught up with their back orders, and steel is not in the demand that prevailed up to the middle of August. The next thirty days will bring out the weakness or strength of these industries.

In spite of the bad outlook in the lumber and iron industries, this section of the country should be in good shape during the early fall months. The market for automobiles in Alabama should be good during that time.

Louisville

LOUISVILLE, KY., Sept. 4—Automobile dealers here expect to have the best fall business they have ever enjoyed. This expectation is based upon the unusual way in which sales have held up during the summer. The peak month this

year was May with 1177 new car sales. June totals dropped to 1027 and July to 929. August held comparatively steady with 932 sales.

Analyzing the sales figures, additional basis for the expectation of good fall business is found in the fact that the demand for closed cars has not yet appeared. The bulk of business is still in open cars. In fact the proportion of closed cars sold in August was less than in July.

Assuming that the closed car is well established, it is reasonable to expect a considerable demand for this model to develop in September and October, and thus give dealers a busy fall season.

Indianapolis

INDIANAPOLIS, Sept. 4—A distinct betterment in retail and State distribution sales began to be marked by mid-August. During the last ten days the trend has been steadily upward, both for local and State selling conditions.

Local county fairs throughout Indiana, where exhibits of cars have been held, have brought exceedingly good sales records, and much more rural interest in new car buying than had been expected at these events. Some salesmen who have made circuits of county fairs to date say that September and fall sales of cars will be double in volume over last fall.

The bumper corn crop with strong price tendencies, and with hogs also going up, will net Indiana farmers \$15,000,000 more than last year, including the wheat losses. New models and new prices have done their share in stimulating current sales. Many dealers are finding it difficult to fill orders without making customers wait. The closed car market is in the best condition it has been this season.

Salt Lake City

SALT LAKE CITY, UTAH, Sept. 4—Automobile firms generally are not looking for a very large turnover this fall. They expect the city business will be satisfactory in volume, but they are of the opinion that the price of wheat will keep the farmers from buying and that it will also have some effect on city sales.

Business men in other lines, however, do not think the price of wheat should figure to any appreciable extent in the purchasing power of the farmers of this section. Wheat is not the principal agricultural crop, and prices for everything else, as well as transportation facilities, are all that could be desired.

Manufacturing is from 20 to 50 per cent ahead of last year at this time. Mining is also much better, and the mining industry is an important one in Utah. More money has also been brought to Utah this year by tourists.

Chicago

CHICAGO, Sept. 4—A season of intense competition in the selling of automobiles appears to be in prospect for dealers in Chicago and surrounding territory. The situation has developed in the last few weeks into what is probably more completely a buyers' market than has existed for many months.

The used car appears to be at the bottom of the matter. The results of a very active spring and summer of selling new cars, for most of which old cars were taken in part payment, are now being felt. There are available great numbers of used cars of well-known makes at prices from 10 to 25 per cent lower than such cars would have brought a month or two ago.

There is still a good demand for new cars, and the prospects are that the demand will be greater in the next two months. Most of the prospective purchasers, however, will have used cars to trade in, and with used cars selling at bottom prices it is hard for the dealers to get them for allowances that will leave them a profit.

General business conditions in this territory remain sound. The harvesting season is at hand and crops are good. Although prices are not all that the farmers would like, they are sufficient to bring in a lot of ready cash. Employment in the industrial centers continues to be general.

Kansas City

KANSAS CITY, Sept. 4—The almost universal optimism concerning sales next spring in the Kansas City territory is worthy of comment in view of slim prospects for the immediate present. The lack of purchasing power this fall, due to low agricultural profits, is a very real handicap in several sections, and its effects are being felt in the cities also.

Even though wheat may rise in price to a level that will bring a profit, very many farmers have already sold wheat at an actual loss—not all being able to hold for the higher levels.

The real feature of the motor car situation in much of the Kansas City territory is the heavy demand for used cars. There are very many dealers who have only one or two used cars on hand, and customers waiting for others of their choice. The same situation exists as to tires—in the small towns tire dealers having many calls a day for used tires and being unable to fill them.

Sales of new cars may be lower than usual this fall and winter for a good business reason: Dealers seem generally to be scanning credits very closely and are less inclined to take a chance on a doubtful financial risk, and also less prone to make wild trades merely for the fun of selling new cars.

EAST REPORTS GOOD BUSINESS AHEAD

New York

NEW YORK, Sept. 4—Although August in the metropolitan district showed an appreciable falling off in sales over the previous month, it maintained generally a better volume than August a year ago. Aside from the seasonal slowing up of business, due to the large number of people on vacations, the announcements and rumors of new models contributed considerably to this condition.

What has served to lessen the force of the August depression in the sales curve has been the remarkably bright prospects for good business in September. This is true in all price classes. Public interest in new models has been strong and the establishments that have them on their floors are booking heavily for early fall delivery.

As was expected, the used car market slumped sympathetically. While the demand has been the weakest of any month this year, perhaps, the stocks of used cars in most instances are not heavy enough to affect seriously earnings during the remainder of the year.

There has not been much appreciable change in the truck market in the metropolitan area. The demand has been fairly strong, especially for the lighter jobs, although many inquiries that are expected to materialize in sales in September and October have been reported.

Baltimore

BALTIMORE, Sept. 4—Automobile dealers of this city are looking forward to an unusually good business during the coming fall months. Although the business was inclined to be somewhat slack during August, when that month was compared with other summer months, the belief is general that with the people back from their vacations there will be a decided resumption in buying starting with this month.

Price reductions that have been announced on a number of cars are expected to play an important part in helping business. Already the dealers who have just announced these reductions have noticed an increasing amount of interest in their cars.

On all sides the belief is apparent that the demand for closed models will be better this fall than ever before. For some time the interest in models of this kind has been growing rapidly, and this fall is expected to see even greater demand.

Philadelphia

PHILADELPHIA, Sept. 4—Increasing interest is evidenced by the public in the new passenger car models, and a gratifying upward trend is noted in sales all along the line. The call for closed models is becoming more insistent, but

some dealers in the more inexpensive types of cars say that standard phaeton models are scarce and that they are getting few or no deliveries of them.

The outlook for fall trade, according to numerous dealers, is particularly good, even in the outlying rural districts where the farmers complain that they have no money to spend. Many of these dealers are turning their attention toward the industrial, business and professional prospects and letting the farmer go for the present. Suburban sales are generally brisk.

Out in the State, especially in and around the anthracite regions where many low-priced cars are purchased, there is considerable doubt about good business, especially if the hard coal miners' strike is prolonged. Many of the foreign laborers, when they see indications of a long strike, return to their native countries. Even if they stay here, they shut down on buying, although when times are prosperous they are apt to be more lavish in their expenditures than are the residents of most localities.

Pittsburgh

PITTSBURGH, Sept. 4—The outlook for fall in the retail field is better than it has been for many years, according to local dealers, who base their deductions on a great interest evidenced in the new models and the number of inquiries received.

Business at the present time is rather slow, but there is considerable satisfaction in the fact that the seasonal decline has not been as great as it was in the last two years.

Medium-priced cars are expected to do a good business this fall, especially those that have made radical changes in design. The larger proportion of trade is expected to be in the closed jobs.

Dealers in \$2,000 cars and upward are prepared for a good business in closed models. The demand for these cars is particularly good, dealers handling them say.

Buffalo

BUFFALO, Sept. 4.—After a spring and summer during which business has been good, all things considered, Buffalo's automobile dealers are looking forward to a satisfactory fall season, with all indications that their expectations will be realized.

Some dealers handling the more popular makes of medium-priced cars are unable to make deliveries. The demand for closed cars is steadily growing, dealers reporting that from 50 to 75 per cent of the total demand for cars is in favor of the closed style.

Used cars are reported to be moving consistently.

Boston

BOSTON, Sept. 4—The hiatus in buying cars that hovered about some of the motor dealers in August is disappearing. Distributors in Boston, and their dealers outside, expect to get a new crop of orders with the holidays out of the way. Some of the men handling the larger cars have many prospects who are on the way back to the city and surrounding places after a tour of Europe, or a vacation out of town. With the 1924 models coming on the market, they will have something to talk about.

The others, handling medium-priced cars, find that their sales, with a few exceptions, are going along at a steady gait. Those dealers who have cars in and around the \$1,000 class report that they are still behind in deliveries of both open and closed models. Truck dealers report that they are doing very well.

St. Louis

ST. LOUIS, Sept. 4—Automobile dealers here are optimistic over the outlook for fall trade. There has been no appreciable decline in sales during the past month, and the introduction of new models has stimulated trade.

As has been the case all summer, the closed car has been the feature, and it is anticipated that this preference will be more pronounced with the approach of cold weather.

The farmer, now that his harvesting season is approaching its completion, is expected to be in the market for cars, and already the added interest is seen in the activities of the country dealers.

In the truck field sales have been slow and a betterment of this condition is hoped for with increased activity in general lines of business.

Toledo

TOLEDO, Sept. 4—The outlook for fall business in the Toledo district is exceptionally good, dealers report. New models and prices have been well received during the month of August and indications are that closed models will be in more than normal demand during the next few weeks.

August was on a par with July for sales which represented only about a 10 to 15 per cent decline from June of this year.

Farmers in this territory are in good condition and with high prices for corn and other crops, with the exception of wheat, will be able to come into the automobile market.

The used car situation in Toledo is better than it has been since 1920. Reports this week show that there are on an average about 10 cars to a dealer in stock which indicates that the movement in used cars has been of greater volume than usual in the last two months.

Men of the Industry and What They Are Doing

Coker F. Clarkson Returns Home

Coker F. Clarkson, general manager of the Society of Automotive Engineers, returned Sept. 1 from a two months' trip through France, Switzerland and England. Clarkson found the French and British designers struggling with many of the problems which are confronting American engineers. He spent much of his time touring and came back with a very clear picture of road and traffic conditions in the countries which he visited.

Kilpatrick Joins Chalmers

W. H. Kilpatrick, recently made assistant to the president of the Willys-Overland Co., has resigned and will leave in a few days to take charge of the Chalmers plant at Detroit. Kilpatrick went to Toledo in March, 1920, and served through the reconstruction period of 1921 and 1922 at the Overland plant. One of his big accomplishments was a new system of man power control which enabled the company to vary its working force with immediate production changes.

Elected to John Brennan Board

Charles T. Kingston, vice-president and general manager, and Huston Taylor, vice-president and sales manager of John Brennan & Co., Detroit, have been elected to the board of directors.

Promotion for D. A. Burke

D. A. Burke, who has been in charge of the Peerless Motor Car Co.'s eight branches for several months, has taken complete charge of branches and all other mediums of distribution, with the title of vice-president and director of sales.

Hanson Stutz Advertising Head

Walter P. Hanson, formerly advertising manager of the Haynes Automobile Co., has been appointed advertising manager of the Stutz Motor Car Co. of America by H. R. Hyman, head of the Stutz sales and advertising departments.

Hauser Named District Manager

J. E. Hauser has been appointed district manager in charge of the office opened at 110 Eleventh Street, Toledo, by the United States Electrical Tool Co. of Cincinnati.

Bailey Makes Change

Charles E. Bailey, formerly advertising manager and assistant sales manager of the Templar Motors Co. of Cleveland, has been appointed sales manager of the Commercial Poster Co. of Cleveland.

Clark-Turner Appoints Reynolds

Harry C. Reynolds has been appointed sales manager of the Clark-Turner

Piston Co., manufacturer of "De Luxe" pistons.

Reynolds has been with the company for the last two years in the capacity of factory representative in the Northwest.

H. C. Smith Goes to Milwaukee

H. C. Smith of Akron has been appointed manager of the Milwaukee branch of the Mason Tire & Rubber Co., controlling Wisconsin and Upper Michigan territory. He was for nearly seven years with the Mason factory and in all has devoted thirteen years to the tire industry.

Tire Dealers Make List of Convention Subjects

NEW YORK, Sept. 4—Themes for discussion at the fourth annual convention of the National Tire Dealers Association, which will be held here Nov. 13-15, have been selected.

Based on the main topic, "What Is Wrong with the Tire Business," the dealers will discuss the following subjects:

Are there too many manufacturers?

Are there too many dealers?

To what extent are the business qualifications of a person looked into before receiving dealer consideration from the manufacturer?

Is spring dating an evil which might cause the disruption of the tire industry by overstocking?

Is the publication of list prices injurious to the tire business?

Should the tire business, in regard to prices, be put in the same classification as sugar or milk or other necessities of life?

Is the standardization of types and sizes of tires a needed factor to overcome over production by manufacturers and overstocking by dealers?

Is it important that manufacturers secure fewer dealers and better dealers for the handling of the same make of tire?

Should tire dealers handle one, or more makes of standard tires?

King Motor Will Move Its Plant to Buffalo

DETROIT, Sept. 4—The King Motor Car Co. will move its plant to Buffalo about Sept. 15 and expects to be in production in that city by about Oct. 15. It does not anticipate any change in models or prices incidental to the moving but will continue its present lines in the new location.

The company will have increased space in Buffalo and will operate on a somewhat larger scale than in this city; just how much larger, however, has not yet been determined.

Manufacturing will be suspended in the next week and will not be resumed until the plant has been completely moved. The company has a large inventory of equipment and material, which it will take with it.

Wood's Motor Boat Wins Detroit Race

Given Final Decision After Protest Had Been Made by Col. J. G. Vincent

DETROIT, Sept. 5—Gar Wood's "Teddy" was officially declared the winner in the International Sweepstakes by the race committee of the Yachtsmen's Association of America when it met yesterday to consider the protest filed by J. G. Vincent, owner and driver of the Packard "Chriscraft No. 2," which finished second.

The protest was based upon the failure of the Wood craft to replace its hatches when lost in the forty-fourth lap, until the forty-eighth. The rules of the race required each entry to have its motor compartment completely inclosed at all times.

The committee based its decision upon the fact that the error rested with the committee in failing to flag the boat off the course when the hatches were first lost. This and a misinterpretation of the rules on the part of the "Teddy's" crew actuated them in refusing to enforce the rule, it was announced. F. R. Still, chairman of the committee, said that if Wood's boat had been flagged when the defect was noted the Vincent boat in all probability would have been the winner.

Decision Satisfies Vincent

Vincent in filing the protest said he would be satisfied with any action the committee might take. He stated that he had built his boats according to the spirit as well as the letter of the rules and that instead of racing machines he had entered fully equipped, serviceable boats, for the development of which, and for the development of fully equipped standard motors, he believed the race primarily was instituted.

Three of the entries in the sweepstakes were entered by Colonel Vincent, two of which took second and third. The third, driven by Joe Boyer, was forced out by battery trouble. The Edsel Ford-owned "Grayhound" was out for engine trouble. Two boats entered by Horace E. Dodge were out early because of accidents, one of which was piloted by Louis Disbrow.

In the Sallan trophy race the "Margaret," owned by Lawrence Fisher of the Fisher Body Corp., was barred because it showed too much speed in one of the heats. The Packard "Chriscraft" repeated its victory of last year in the Gold Cup race.

Injury to his back suffered by Edsel Ford in working over his entries in the sweepstakes compelled him to forego the driving of the boat in the race as he had planned.

Oakland Will Reach Capacity This Month

Producing 100 of New Model at Present—Plans Extensive Newspaper Campaign

PONTIAC, Sept. 1.—The Oakland Motor Car Co. is now in part production on its new models and will reach full production during the month as its factory equipment and conveyor systems are completed. The factory has been completely changed as regards production layout and will have a capacity of about 300 daily when fully under way. The output for the present is limited to about 100.

The new Fisher body plant which has been built about half a mile from the Oakland factory will get into operation about the middle of September. For the present the company is bringing its bodies by truck from the Fisher factories at Detroit. The Fisher Pontiac plant will be devoted exclusively to Oakland work and will give employment to about 4000 operatives.

Oakland is laying out an extensive newspaper advertising campaign, said to be one of the largest ever launched by an automobile company. This will start with information on the new car released to the newspapers this week. As a publicity feature in connection with the new line the company is starting out six of its new models which will be run to six cities at extreme points in the United States. The feature of this publicity will be to demonstrate the performance of the new car under any and all road conditions as encountered in different sections of the country.

Country Fairs Helping Sales With Farmers

(Continued from page 498)

report business to be sufficiently active to keep programs at the same level during September and running further into the fall. It is not to be expected that in the remaining months the industry as a whole will reach any of the output marks reported for the high production months of the first part of the year.

Despite a falling off in sales by parts makers during July, conditions in this branch of the industry are good. Some improvement was noted in August and present reports tend to show that there will be a further forward movement in September. While sales declined in July, the total volume was in excess of that for the same month of the preceding year. Collections are good.

Tire manufacturers are not announcing increased production schedules pending the more active move-

ment of finished goods inventories and reports from dealers of low stocks. It is evident that this branch of the industry is making efforts to keep production close to actual needs and to prevent, in the future, the accumulation of heavy inventories in dealers' hands. One of the major companies is discountenancing stocks that cannot be moved easily within two weeks. The movement of tires from factory warehouses is reported to be showing some betterment.

Howard Wilcox, Racer, Meets Death on Track

ALTOONA, PA., Sept. 5.—Howard Wilcox, winner of the Indianapolis sweepstakes in 1919 and a driver who has been a sensational performer for the last fifteen years, was killed yesterday in the opening event on the new track here. Wilcox was in the 117th lap of the 200-mile race, being third at the time.

He ran so low on the turn that his car was off the planking and on the dirt at the pole. Trying to regain the track the car skidded, rolled over several times and Wilcox was so badly injured that he died a few minutes later on the way to the hospital.

200 Mile Altoona Race Won by Eddie Hearne

ALTOONA, PA., Sept. 4.—Eddie Hearne in a Durant Special won the 200-mile race which marked the opening of the new Altoona Speedway today. He went through without a stop in 1:47:37.35, an average of 111.5 m.p.h. This gives him a commanding lead in the championship title contest with 1202 points.

Second to Hearne today was Jerry Wonderlich in a Durant Special; Dave Lewis, Duesenberg Special, was third; Comer, Durant Special, fourth; Hill, Duesenberg Special, fifth; Elliott, Durant Special, sixth; Duray, Duray Special, seventh, and Milton, H. C. S. Special, eighth.

Howard Wilcox, driving a Duesenberg Special, was in third place on the 117th lap when he met with an accident that resulted in his death.

1924 Columbia Six Line Has Several New Models

DETROIT, Sept. 5.—Ten cars are included in the 1924 line of Columbia sixes, several of these being entirely new. A considerable number of improvements have been made in both the chassis and bodies and the prices have been reduced.

The new Hollywood models offer a wide range of colors and finish and also option in upholstery to meet individual taste and preference. There are three Hollywood models, the phaeton, sedan and coupé.

G. M. C. Made 65,000 Sales During August

Compares With 51,657 in July—New Buick Models Proved Factor in Increase

NEW YORK, Sept. 4.—General Motors Corp. reports 65,000 sales for its automobile units in August in comparison with 51,657 in July. This advance might be explained by the introduction of the new Buick models on July 1, since which time the Flint plant has been rushing production to the limit.

As reported, the preliminary combined sales in August of the American and Canadian passenger and commercial car manufacturing divisions is as follows:

	1923	1922
January	49,162	16,088
February	55,458	20,869
March	71,696	34,082
April	75,854	40,074
May	75,420	46,736
June	69,708	48,541
July	51,657	33,772
August	*65,000	42,840
September	35,443
October	40,815
November	50,232
December	46,871

*This preliminary figure of sales includes Buick, Cadillac, Chevrolet, Oakland, Oldsmobile passenger and commercial cars and GMC trucks.

Plants Ready for Big Operations This Month

(Continued from page 498)

this same figure. Durant is building about 100 fours daily at the Lansing plant.

In the higher priced lines Packard is at capacity and is approximating 100 daily. Cadillac after making a number of plant changes is increasing output and will reach capacity during the month. Wills Ste. Claire will increase production during the month and is gradually extending its retail organization.

Truck output is expected to improve during the month after a rather severe slowing down during the summer months.

PRICES OF NEW OAKLAND

DETROIT, Sept. 6.—Prices on the new Oakland models are announced as follows: Standard phaeton and standard roadster, \$945; sport touring and sport roadster, \$1,095; business coupe, \$1,195; four-passenger coupe, \$1,345, and sedan, \$1,395.

FORDS MEET WAR SECRETARY

WASHINGTON, Sept. 6.—Henry and Edsel Ford called on the Secretary of War this afternoon. They refused to disclose their mission, but it is thought that the conference was in regard to Muscle Shoals.

Farmers Able to Buy, Finley Mount Asserts

Tractor President Says They Are
Enjoying Reasonable Amount
of Prosperity

CHICAGO, Sept. 1.—Farmers are much better able to pay to buy tractors and other needed commodities than they were in 1921 or 1922, according to Finley P. Mount, president of the Advance-Rumely Co., who characterizes as "loose talk, bunk and political propaganda" much of what has been said and printed about the poverty of the farmer. In a letter to the selling agents of his company he discusses the situation as follows:

"Of course some farmers are losing money. So are some people in every other business. Some farmers will always lose money, because they either do not know how or will not learn how to manage their business properly, and this is true of every other business. But good farmers are now enjoying a reasonable degree of prosperity."

Have More Money Than in 1921

Continuing, he says:

In 1921 the farmer was pretty hard hit. In 1922, by reason of better prices for some commodities and better yields of others, his crop brought him \$2,000,000,000 more than in 1921. Now in 1923, measured by present prices and estimate of yields, he will have \$1,000,000,000 more money for his crop than he had in 1922, or \$3,000,000,000 more than he had in 1921.

True, wheat recently dropped below a dollar in Chicago, but did it ever occur to you that wheat constitutes only 7 per cent of the total value of farm products in the United States? The loss in the price of wheat is greatly outweighed by the increase in the price of corn. The low price of wheat may reduce the acreage put to wheat, but be assured that acreage must be farmed; it will go into something else.

The point I want to stress is that the farmer today is better able to buy our machinery than he was last year, and we know from actual experience and results he was much better able to buy in 1922 than in 1921. We must not therefore allow this talk about agricultural depression, much of which is political bunk and propaganda, to slow us up in our sales efforts for 1923.

I want to tell you that in my judgment our business has suffered more this year from the loose talk than from the farmer's actual condition. There are farmers aplenty who are able to buy, and it is up to us to find these farmers and sell our goods.

St. Louis Automotive Co. Has \$2.85 Cash in Bank

ST. LOUIS, Sept. 4.—Depositions taken in the suit against the St. Louis Automotive Co. by Mrs. Kathryn Gerdes on behalf of her son, John, disclosed that the company had \$2.85 in the bank and debts of several thousand dollars.

John Neskov, president of the company named in the suit, said the assets of the firm had gone in salaries and the

\$18,126,317 WAS TAX OF INDUSTRY IN JULY

WASHINGTON, Sept. 4.—Reports of the Commissioner of Internal Revenue show that in July the Department collected a total of \$18,126,317 in taxes from the automobile industry, which includes \$13,501,156 from the passenger car makers, \$1,360,305 from trucks and wagons, and \$3,264,854 from parts and accessories. In comparison with July of last year this total is two and one-half times greater, or 246 per cent.

Inasmuch as production is only one-third more than at this same period last year, this is interpreted to mean that the higher priced cars are moving faster than in 1922.

The \$13,501,156 collected from the passenger car makers in July represents a wholesale business of \$270,000,000.

Last year the automobile industry paid in excise taxes a total of \$114,793,400. At the present rate the taxes this year will run in the neighborhood of \$160,000,000.

building of five automobiles, which are in storage and against which there are mortgages.

Mrs. Gerdes states she had invested \$13,450 in the corporation without permission of the probate court and had been removed as administratrix of her husband's estate for doing so.

Brunswick-Balke Heads Quit as Tire Officials

AKRON, Sept. 4.—The B. F. Goodrich Co. announces that it has acquired complete control of the Brunswick tire through the purchase of the entire issue of \$100,000 common stock and patent rights of the Brunswick Tire Co., a recently organized subsidiary of the Brunswick-Balke-Collender Co.

At the same time President B. E. Bensing and Vice-President H. F. Davenport resigned their offices in the Brunswick Tire Co., although they retain their executive positions with the Brunswick-Balke-Collender Co.

The transfer of stock completes the transaction whereby the Brunswick-Balke-Collender Co. quits the tire manufacturing field. This was brought about by its desire to utilize the plant at Muskegon and the capital tied up in the tire business for a further expansion of its other business.

SCHWAB INSPECTS PLANT

PHILADELPHIA, Sept. 4.—Charles M. Schwab has contemplated an inspection tour of the American Motor Body Co.'s plant in Detroit, and it is expected that at an early meeting of the directors he will become chairman of the board.

Taxes Paid in Year Totalled \$144,284,402

Government Received \$39,850,-
637 More from Industry
Than It Did in 1922

WASHINGTON, Sept. 4.—Reflecting an increase of \$39,850,639, excise taxes collected from the automotive industry for the fiscal year ending June 30, 1923, aggregated \$144,284,402, as against \$104,433,762 for the fiscal year 1922, according to a preliminary report of Commissioner of Internal Revenue D. H. Blair.

Of the total excise taxes collected from the industry for the fiscal year 1923, \$92,735,852 was derived from passenger automobiles and motorcycles, and represented an increase of \$36,051,311 over similar collections for the fiscal year 1922.

Collections from motor trucks amounted to \$10,677,907, an increase of \$2,273,349.

Collections from tires and accessories aggregated \$40,870,643, an increase of \$1,525,978.60 over collections for the previous fiscal year. Revenue from passenger automobiles for hire amounted to \$1,899,205 for the fiscal year 1923, an increase of \$113,585.99 over the fiscal year 1922.

Total collections of internal revenue from all sources for the fiscal year 1923 aggregated \$2,621,745,227, a decrease of \$575,705,855.

Blair says that the loss of revenue due to the repeal, effective Jan. 1, 1922, of transportation taxes, insurance and various excise taxes, was offset materially by the increased revenue for 1923, principally from tobacco manufactures, of \$38,255,666 and from automobile accessories, etc., of \$39,850,639.

Tax Collections in June

Excise taxes collected from automobiles, motorcycles, accessories, etc., in June, 1923, according to a report made public simultaneously with the annual preliminary report, totaled \$16,069,326, an increase of \$3,951,202 over similar collection for June of last year, when the total was \$12,118,123.

Of the collections for June of the present year, \$11,567,943 was from passenger automobiles and motorcycles as against \$7,848,477 for June of last year.

Collections in June of this year from motor trucks amounted to \$1,237,882, being slightly less than for June of last year with a total of \$1,253,575.

Collections from accessories and parts for June, 1923, amounted to \$3,263,500, as against \$3,016,071 for June of 1922.

MIDWEST RUBBER MAY MOVE

CHICAGO, Sept. 1.—A meeting of the Midwest Rubber Manufacturers Association has been called for Sept. 11 at the La Salle Hotel. A proposal that the offices of the association be moved from Chicago to Akron, Ohio, will come up for discussion.

Plans for Motorway in Britain Advance

Parliament Will Be Asked for Authority to Condemn Land Where Necessary

LONDON, Aug. 20 (by mail)—Since the original announcement was made some months ago, good progress has been made in the preliminaries concerned with the construction of a 226-mile motorway, extending from London in the southeast of England to Birmingham-Liverpool-Manchester and other big centers of population and industry in the Midlands and the northwest.

Before work can be commenced it is essential that the authority of Parliament should be secured to purchase, by compulsory arbitration if necessary, the land upon which the way will be constructed. In order to reduce opposition to the plan—which, it is estimated, will cost £10,000,000—the promoters are meeting the local councils, chambers of commerce and other interests concerned and have succeeded in practically every case in obtaining approval and promises of assistance.

Passes Through Big Centers

Early next year the needed Act of Parliament will be put forward. Meanwhile details have been made known and plans relating to the route, section of the road and form of junction with public highways are also available. The route passes through or close to some of the most populous centers of England and will form direct means of communication between London and the highly important industrial and manufacturing areas of Lancashire and the Midlands; in fact, the districts included contain centers and cities between which passes by far the greatest volume of traffic of the country.

It is not intended that the motorway should be available for either pedestrian or horse traffic; it will be strictly reserved for mechanically-propelled traffic, and two classes of this traffic will be provided for, namely:—(1) Passenger and light goods traffic traveling at high rates of speed; and (2) heavy goods traffic carried on trucks, etc., at lower rates of speed.

Road to Be 50 Ft. Wide

In the first instance, the road will be 50 ft. wide, but in acquiring the necessary lands, it is proposed to take a sufficient width to allow for any future necessary widening, and also to provide for the erection of factories, warehouses, motor parks, offices, oil stores, repair shops, etc. This width of 50 ft., which already has been adopted in the case of the main public arterial roads around London, will admit of four lines of traffic with ample clearance, thus providing an "up" and a "down" line for each class of traffic.

On the road no gradient will be steeper than 1 in 40, and no curve will be sharper than a half of a mile radius; the road, in fact, will be built for fast or semi-fast mechanical traffic, and throughout its entire length will be wholly enclosed and uninterrupted.

There will be no level crossings, but junctions with all principal roads leading to towns along the route will be provided. Where it is necessary to cross a railway, canal or public road, the motorway will be carried either under or over by means of a tunnel or bridge, of sufficient span to allow for any future widening if necessary.

Present Roads Unsuitable

It is held that the principal hindrances at the moment to the economic development of motor transport are the inadequacy and unsuitability of the existing road system of England to carry fast and heavy motor traffic, plus the legal restrictions with regard to speeds and the use and construction of vehicles. Even after widening and improving the present public highways, the existence of cross roads remains an almost overwhelming difficulty. When the proposed motorway is constructed these difficulties will disappear.

The heavy automobile industry, it is believed will welcome such a road, because it will enable manufacturers to construct vehicles which will provide economy in haulage hitherto impracticable because of the natural and artificial restrictions.

To the transporters of goods, it is submitted that they will be able, in addition to the advantages enjoyed by the private motorist, to effect a direct saving in actual cost of transport amounting to from 20 to 35 per cent, at least after payment of the traffic tolls, because the operating costs will be so much lower than on ordinary roads.

Time Saving a Factor

But apart from the saving in the actual cost of transport, there are other very important considerations in favor of the motor transport user. Convenience, time, speed, certainty of delivery at time approximating expectation, avoidance of frequent loading and unloading, personal supervision of load throughout the journey, condition of goods on delivery, and freedom from restraint of an inconvenient time-table and to arrange time convenient for dispatch.

All these are, it is true, existing advantages of road transport, the appreciation of which is largely responsible for its enormous development, but which will be much accentuated by the provision of a motorway.

Motor transport experts are said to be satisfied that the actual cost of operating heavy motor vehicles over the motorway ultimately will be at least 50 per cent less than the cost of operating on ordinary roads, taking direct and indirect economies.

The motorway, it is claimed, will enable
(Continued on page 512)

Schultz Wins Trophy in Pikes Peak Climb

Drives Essex Special Over 12 2/5 Mile Course in 15 Minutes, 47 3/5 Seconds

DENVER, Sept. 4.—To the pride of Colorado Springs over its \$250,000 highway on Pikes Peak there was added today extra pride over one of its own citizens, Glen Schultz, who captured the Penrose trophy in the fifth annual Pikes Peak hill climb by driving his Essex Special up the 12 2-5 mile race course in 18 min. 47 3-5 sec. This crowded the course record of 18:24.7 made in 1916 by Ralph Mulford in a Hudson.

Besides this one year award of the silver and gold trophy, Schultz won \$500 cash prize for cars up to 183 cu. in. piston displacement and limited to 1600 pounds weight.

The second prize of \$200 for cars in this class went to D. W. Day in a Chevrolet, the time being 26:15 2-5.

The first and second in the event for cars up to 300 cu. in. and 1800 pounds weight was won by Otto Loesche and Jack Knight in Lexingtons in 19:29 4-5 and 21:48 2-5 respectively.

Above 300 Cu. In. Event

The event for cars above 300 cu. in. displacement and up to 2000 pounds weight went to Charles Myers in a Studebaker and J. C. Allen in a Paige in 19:21 2-5 and 20:22 2-5 respectively, Myers making the second best time today.

Loesche won the trophy three years ago and one event two years ago, while Schultz, today's trophy winner, carried away cash prizes in the last two years. Thus far no driver has won the Penrose trophy more than once out of the three times required for permanent possession. Trophy winners in past years were Rea Lentz in a Romano, King Rhiley in a Hudson and Noel Bullock in a Ford.

All climbs were conducted under A. A. A. sanction and were for non-stock cars with cash prizes of \$500 and \$200 in each of the three events. The climb starts at an altitude of 9150 ft. and ends at 14,109 ft. with grades ranging from 7 to 10½ per cent.

Hawkeye to Concentrate on Cord Tire Production

DES MOINES, IOWA, Sept. 4.—The Hawkeye Tire & Rubber Co. has discontinued all types of fabric tires and will concentrate its factory facilities on the production of a new cord tire, according to announcement made by the management.

The new product is an all-black tire and will be built about 10 per cent oversize. New mold equipment has been ordered and production of the new tire will begin in about two weeks. The cord was shown for the first time at the company's booth at the Iowa State Fair.

Industry Is Affected by Japan Earthquake

American Companies Represented
There Await Definite Advices
From Agencies

(Continued from page 499)

sidered until definite communication is established with the Japanese representatives.

Sales of the Star and Durant lines in Japan began in June of this year, the distribution rights being given to L. J. Healing & Co. of Tokio. The agency for the city was placed, according to available information, with the newly organized American Japan Star Motor Sales Co., with sales stations, garage and body building plant at Tokio. The New York representatives of both the Healing and the American Japan companies believe that the establishments of both were destroyed.

Cars Believed on Docks

A shipment of five cars going to the Packard distributors—Niagai Kogyo Kaisha at Tokio—are believed to have been on the docks at Yokohama at the time of the earthquake, as they were cleared on the steamship Empress of Asia. Dispatches indicate that this vessel was in port at the time. B. G. Budd, general manager of the Packard Motors Export Co., has endeavored to get in touch with the company by cable, but has been unable to receive information of any sort bearing on the disaster.

The Niagai company has been an active one, maintaining a large body building plant, in addition to sales and service station at Tokio. Six branches were operated in other cities, including one in Yokohama. Several hundred Packard trucks were put in service during recent years by the Japanese army and in municipal work in Tokio.

Shipments Now En Route

Two days before the quake cable requests were received by the John N. Willys Export Co. to rush shipments of cars ordered by the Nisshin Automobile Co., Willys distributor, with headquarters in Yokohama and a branch at Osaka. Some shipments to the company now are en route and others are due to move out on early steamers. The Nisshin company, owned and operated by Japanese, maintained a large establishment in Yokohama and this is presumed to have been destroyed.

The United States Rubber Export Co., which handles U. S. tires and allied products, was represented in Japan by P. F. M. Kievenaar, whose headquarters were in Yokohama. The office there was opened in April of this year and Kievenaar and his family sailed from San Francisco just prior to that time.

The last direct communication from him was dated Aug. 27, a brief cable to the effect that he would open an office in Tokio Sept. 1 in the new Marunouchi

building, near the railroad station. Kievenaar, an American citizen, was formerly in the automobile and tire business at Batavia, in Java, but during the depression came to the States.

No stocks were held by the company in Japan, but it was planned later to warehouse the products either in Yokohama or Tokio. The company has been active in Japan for some years and was represented in Tokio by nine resale agents, in Yokohama by three and in Osaka by two. A considerable increase in sales was experienced during the first part of the year.

News reached here today that F. A. Seibler, a traveler for Melchior, Armstrong & Dessau, had left Yokohama before the disaster and had gone to Kobe. This house represents Stutz, Anderson and the Stewart truck.

Market for Cars Wiped Out

DETROIT, Sept. 5—The Japanese market for passenger cars will be practically wiped out if the destruction by fire and earthquake is as complete as newspaper reports to date indicate, say export sales managers here. Practically all of the business in the country centered in the district about Tokio and Yokohama, because of road conditions. Under the dual aftermath of financial strain and road destruction, it is feared passenger cars cannot only not be sold but cannot be used. Trucks are expected to play an important part in reconstruction.

FINANCIAL NOTES

Reo Motor Car Co.'s balance sheet as of June 30 is as follows: Assets—Real estate, \$320,308; inventory goods, chattels and other tangible property, \$7,668,010; cash, \$5,426,714; value of credits owing to the corporation, \$5,792,376; buildings and equipment \$5,378,246; deferred charges, \$31,559; investments, \$569,444; total, \$25,186,657. Liabilities—Common stock, \$15,000,000; liability on all unsecured indebtedness, \$3,171,889; deferred credits, \$9,224; dividends payable, \$1,022,405; surplus (representing net value of properties, less outstanding indebtedness and paid-up capital), \$5,983,139; total, \$25,186,657.

Dodge Brothers' balance sheet as of June 30 follows: Assets—Real estate and machinery, \$22,317,699; merchandise, material and other tangible property, \$13,433,676; cash, \$20,365,057; value of credits owing to corporation \$10,496,900; Liberty bonds and other investments, \$8,454,001; total, \$75,067,333. Liabilities—Common stock, \$50,000,000; liability on all unsecured indebtedness \$12,299,865; surplus (representing net value of properties, less outstanding indebtedness and paid-up capital), \$12,767,468; total, \$75,067,333.

Wright Aeronautical Corp. reports net earnings of \$109,583, after taxes, for the quarter ended June 30, against \$41,578 in the first quarter of the year. These earnings do not include any income from the Lawrence interests recently acquired by the company.

Mack Trucks, Inc. has increased the annual dividend from \$4 to \$6 a share by declaring a quarterly distribution of \$1.50 a share, payable Oct. 1 to stockholders of record Sept. 20.

BANK CREDITS

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America.

Although no pronounced change was apparent in the general situation last week, conditions on the whole remained favorable, with further evidence of growing confidence in the business outlook. The most noticeable upward movement took place in stocks, while commodity prices showed some evidence of increased strength.

Cotton rose sharply from 25.60 to 26.35 cents a pound upon the publication of the Government's forecast as of Aug. 25, estimating the year's crop at 10,788,000 bales—728,000 bales less than the previous month's forecast—and the condition at 54.1 per cent, as against 67.2 per cent on July 25.

The latest reviews of the iron and steel industry indicate that conditions were considerably better in August than in July. Prices were firm and buying definitely improved. In Chicago 120,000 tons of pig iron were sold in August, compared with 80,000 tons in July.

Car loadings during the week ended Aug. 18 were 1,035,741, a figure exceeded only by the record total in the week of July 28. The total loadings for the year to date are 20 per cent above those for the corresponding period last year. The net operating incomes of sixty-six railroads in July amounted to \$74,584,600, a gain of 25 per cent from July, 1922.

Professor Irving Fisher's index of commodity prices for the week ended Aug. 31 remained unchanged at 155. The average for August was 154, one point above that for July. Bradstreet's food index for last week stood at \$3.21, as against \$3.18 the week before.

Bank debits reported by the Federal Reserve Board for the week ended Aug. 29 aggregated \$7,557,922,000, a decline of 7½ per cent from the preceding week, but slightly above the corresponding week last year.

Sale of Daniels Plant Is Dated for October 4

PHILADELPHIA, Sept. 4—Announcement is made by Samuel T. Freeman & Co., auctioneers, that they will sell at receivers' sale the plant of the Daniels Motor Co. of Reading Pa., on Thursday, Oct. 4, at Reading. The sale will include the real estate, service rights and good-will, machinery and equipment and stock and fixtures. The same auctioneers will also hold a peremptory liquidation sale of the real estate, machinery and equipment of the American & British Manufacturing Co. of Bridgeport, Conn., on Oct. 1, 2 and 3.

HENDEE MAY CHANGE NAME

SPRINGFIELD, MASS., Sept. 4—At the annual meeting of the Hendee Manufacturing Co. next month, the stockholders will be asked to approve a change in the name of the concern to the Indian Motor Cycle Co.

Casings' Shipments Gained During July

Increase, Also, with Inner Tubes,
but Solid Tires Declined from
Previous Month

NEW YORK, Sept. 5—According to the figures compiled by the Rubber Association of America, Inc., for the Bureau of Domestic and Foreign Commerce, shipments of pneumatic casings and inner tubes increased during July as compared with June, but shipments of solid tires decreased. Inventory and production of casings, tubes and solid tires were less in July than they were in June.

The following shows inventory, production and shipments by months:

PNEUMATIC CASINGS

1922	No. Mfrs. Report-	In- ventory	Pro- duction	Ship- ments
January	66	4,174,216	2,055,134	1,596,806
February	66	4,691,329	2,084,308	1,562,365
March	63	5,183,286	2,645,790	2,073,963
April	65	5,464,336	2,401,187	2,086,651
May	65	5,523,095	2,721,503	2,639,273
June	64	5,042,147	2,838,890	3,133,260
July	63	4,834,106	2,476,636	2,695,095
August	63	4,629,392	2,905,209	3,029,823
September	64	4,612,037	2,504,744	2,502,106
October	64	4,682,958	2,674,662	2,588,770
November	62	4,964,976	2,733,134	2,379,708
December	59	4,599,208	2,656,942	2,934,079
1923				
January	62	4,695,916	3,127,270	2,994,297
February	60	5,224,387	3,217,987	2,588,639
March	58	5,670,601	3,865,726	3,322,637
April	56	6,088,272	3,539,326	2,976,160
May	57	6,906,594	3,659,986	2,757,764
June	55	7,040,600	2,956,943	2,502,185
July	54	6,471,124	1,992,989	2,539,425

INNER TUBES

1922	No. Mfrs. Report-	In- ventory	Pro- duction	Ship- ments
January	66	5,246,647	2,343,393	1,889,724
February	65	6,141,956	2,596,774	1,702,583
March	63	6,991,118	3,017,511	2,090,737
April	65	7,230,096	2,650,573	2,329,343
May	65	7,189,552	2,970,696	2,938,947
June	64	6,186,534	3,130,629	3,973,679
July	63	5,675,839	3,068,199	3,630,744
August	63	5,207,228	3,808,224	4,220,055
September	64	5,164,757	3,501,442	3,558,971
October	64	5,488,033	3,787,758	3,420,680
November	61	6,210,053	3,850,908	3,075,023
December	59	5,732,125	3,411,074	3,825,949
1923				
January	62	5,838,310	3,951,885	3,748,651
February	60	6,771,958	4,039,202	3,001,697
March	57	7,740,945	4,875,414	3,828,315
April	55	8,394,184	4,259,558	3,535,635
May	57	9,292,223	4,317,537	3,414,115
June	54	8,924,326	3,590,011	3,581,060
July	52	7,395,444	2,625,118	3,942,247

SOLID TIRES

1922	No. Mfrs. Report-	In- ventory	Pro- duction	Ship- ments
January	11	181,769	40,224	33,294
February	11	183,448	39,492	36,805
March	11	182,197	49,433	48,350
April	11	173,748	46,664	52,309
May	11	170,904	57,640	60,711
June	11	169,808	66,089	63,408
July	11	176,375	71,505	60,425
August	11	189,698	84,313	69,435
September	11	200,016	82,767	66,797
October	11	213,942	85,480	71,275
November	11	234,684	85,775	61,466
December	10	244,061	77,221	64,576
1923				
January	11	262,462	83,343	60,611
February	11	270,191	75,457	63,394
March	11	265,843	79,788	77,144
April	10	260,631	71,468	72,609
May	10	268,323	77,288	67,147
June	10	283,425	72,445	52,125
July	10	263,891	42,345	45,210

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipment" includes only stock forwarded to a purchaser and does not include stock forwarded to a warehouse, branch, or on a consignment basis, or abroad.

INDUSTRIAL NOTES

Safety Highway Engineering Co. of Milwaukee, a new corporation with \$1,000,000 authorized capitalization, has perfected its organization by electing Bernard Minn president. H. C. Hoppman is vice-president and W. A. Richter, secretary-treasurer. The concern holds American and Canadian patents on a line of highway and street traffic signals, regulators, etc., and plans to start production within a short time. The devices have been built on a small scale for demonstration purposes for a year and are in use in numerous large and small cities of the Middle West.

J. D. Bridges, who has been identified with the automotive manufacturing industry in the Southeast for some years as the president of the J. D. Bridges Co. of Florence, S. C., manufacturer of automobile replacement parts, heads a new company that is being formed by Carolina business men for the establishment of a \$100,000 plant at Greenville, S. C., for the manufacture of textile machinery. Bridges, however, will retain his connection with the Florence company.

Four Wheel Drive Auto Co. of Clintonville, Wis., has taken over the exclusive sale rights of the International earth boring machine. The boring machine will be sold as extra equipment and when attached to the FWD trucks is especially adapted for digging pole holes. Power is supplied by the truck engine by means of a power take-off shaft.

Logemann Brothers Co., manufacturer of baling and scrap metal presses, has purchased the business, patents and good will of the Chicago Baling Press Manufacturing Co. of Chicago. The business now is entirely conducted from the main offices and works of the Logemann company at Milwaukee.

C. A. Dickerson Compressor Corp. of Buffalo has been organized for the manufacture of garage equipment. C. A. Dickerson, president of the company, was formerly general distributor for the Gardner compressor and later engineer for the Wayne Tank & Pump Co. J. H. Ash is chief engineer.

New Britain Machine Co. of New Britain, Conn., has moved its Detroit office from the Garfield Building to 2-130 General Motors Building. Production machinery and screw machine products are handled for the State of Michigan through this office.

American Chemical Paint Co., making A.C.P. rust removing and preventing chemicals, will occupy its new factory at Ambler, Pa., about Nov. 1.

Mat Co., manufacturer of fiber mats for automobile running boards and tonneau, is moving its factory from Muskegon, Mich., to Paducah, Ky.

MITCHELL SALE POSTPONED

RACINE, WIS., Sept. 5—The sale of the property and plant of the Mitchell Motors Co., Inc., advertised for Sept. 12, has been postponed to a date to be announced later.

METAL MARKETS

While steel producers confidently look forward to a gradual broadening in the demand, the aftermath of the holiday continued to be felt in the market throughout the week, many of those who go to make it up having prolonged their absence from business. The unfilled tonnage statement of the Corporation for August, which is to be issued Monday, Sept. 10, is expected to disclose a sharp falling off in the leading producer's backlog of orders, a drop of 700,000 tons being predicted in some quarters. This is accounted for by the impressive shrinkage of bookings in August as well as the much accelerated output during that month.

Steel interests recently unbosomed themselves of broad hints to the automotive industry that reductions in the prices of passenger motor cars can not be made at the expense of steel manufacturers. In other words, if passenger motor car builders expect prices for steel to decline, and have lowered the selling prices for their cars in anticipation of this reduction, they are likely to find that they have made their reckoning without taking into consideration the steel producers' determination to maintain prevailing price levels. It is significant of the change that has come over the steel industry that now price reductions by passenger motor car manufacturers are a real cause of worry.

Not so very long ago steel producers were utterly apathetic to anything and everything that went on in the automotive realm. Then they began to sit up and take careful notice of the automotive output and demand as a barometer by which to gage prospects for their own products. Now the automotive price situation has come to be one of deep concern to the steel manufacturer. Some of the more conservative market observers are beginning to voice the opinion that there is little likelihood of any radical change in steel prices over the remainder of the year, and that 1923 will pass into history as the year having recorded the most stationary steel price levels.

This opinion does not take into account the possibility of a temporary bulge in the demand with the usual accompaniment of a clamor for early shipments that may develop in the course of the next two months. To the extent that the price policy of the chief interest is very likely to aim at conserving prevailing levels over the remainder of the year, the opinion referred to is in all probability correct.

Pig Iron.—Although the market is quiet and held at the \$25, valley, base for No. 2 foundry by sellers' unwillingness to cut under that level, buying interest is broadening, and some tentative inquiries for as far ahead as the early part of next year are reported to have been received by blast furnace interests.

Aluminum.—Resale and odd lots of imported metal continue to form the object of occasional sales in the Middle West, prices representing a relatively wide range. With the exception of sheets, the market presents a somewhat easier tone, although this change appears to have no effect, whatsoever, upon the major market situation, in which the contractual relations between the sole domestic producer and his customers are of paramount importance.

Copper.—The market for ingot copper continues to be a drooping affair. Producers, however, do not fare so badly even with prices as low as they are, because of the greater efficiency in recovery.

Calendar

SHOWS

- Oct. 17-27—New York, Electrical and Industrial Exposition, showing electric trucks, cars, parts and accessories, Grand Central Palace.
- Nov. 4-10 — New York, First Automobile Exposition of the Foreign Automotive Association, Hotel Astor.
- Nov. 11-17—New York, Annual Automobile Salon, Hotel Commodore.
- Jan. 26-Feb. 2—Chicago, Annual Automobile Salon, Hotel Drake.

FOREIGN SHOWS

- Sept. 28-Oct. 7—Berlin, Automobile Show.
- Oct. 4-14 — Paris, Passenger Cars, Bicycles, Motorcycles and Accessories, Grand Palais.
- Oct. 15-20—London, Motorcycle Show, Olympia.

Oct. 24-Nov. 2—Paris, Trucks, Agricultural Tractors, etc., Grand Palais.

Nov. 1-15—Buenos Aires, Annual Automobile Exposition, under the direction of the Automovil Club Argentino.

Nov. 2-10—London, Automobile Show, Olympia.

Nov. 22-Dec. 1—London, Motor Transport Exhibition.

Dec. 8-19—Brussels, Passenger Cars, Trucks, Airplanes and Motor Boats, Aviation Palace.

RACES

Sept. 9—Milan, Monza Speedway, European Grand Prix Race.

Oct. 28—Barcelona, Spain, Grand Prix for vehicles of 1500 c.c.; Nov. 1, International Grand Prix for cycle cars of 1100—Nov. 4, Interna-

tional Grand Prix for two liter.

CONVENTIONS

Sept. 19-21—Boston, Fall Meeting of the Motor and Accessory Manufacturers Association.

Oct. 24-26—Cleveland, Thirtieth Annual Convention of the National Association of Farm Equipment Manufacturers, Hotel Statler.

Nov. 12-17 — Chicago, Annual Business Exhibit and Convention of the Automotive Equipment Association, Coliseum.

Jan. 24-31 — Chicago, Annual Convention and Show of the American Road Builders' Association, the former to be held in the Congress and the latter in the Coliseum.

May, 1924—Detroit, International Motor Transport Congress under the

auspices of the National Automobile Chamber of Commerce.

S. A. E. MEETINGS

Sept. 11—New England Section, Wheel Alignment, John F. Duby, Hotel Buckminster, Boston, 8 p.m.

Sept. 17—Cleveland Section, The Single Eight and Its Merits, J. G. Vincent, Cleveland Hotel, Cleveland, 7:30 p.m., Dinner 6 p.m.

Sept. 20—Metropolitan Section, Headlights, R. N. Falge, Automobile Club of America, 247 West Fifty-fourth Street, New York, 8 p.m., Dinner 6:30 p.m.

Sept. 21—Mid-West Section, Inspection of the Nash plant at Kenosha, Wis.

Oct. 25-26—Production Meeting of the S. A. E.—Cleveland.

Jan. 22-25, 1924—Annual Meeting of the S. A. E.—Detroit.

Retail Firms Show Expansion in South

ATLANTA, GA., Sept. 5—A definite idea of the remarkable development the automobile industry has experienced in the South this year is shown in a report received in Atlanta the latter part of August, and emanating from an authentic source.

The report shows that during the first seven months of this year, Jan. to July inclusive, there were 816 announcements made in the various southern states either of new automobile agency firms, garage companies, accessory dealers, or tire dealers established, or of new construction carried out by existing companies in this field.

Of this total nearly one-half, or close to 400, are probably of new companies that have been formed in the various southern states as agencies for automobiles, dealers in the equipment field, or independent garage companies.

As compared with figures of the same kind for January to July inclusive, 1922, the present year's total is approximately double that of last year.

There was a slight falling off in July, when the total of such announcements was 106.

While this includes a majority of the new companies in all of the southern states, it does not include all of them as information is not available, and it is likely therefore that the entire total for the whole South would be close to 1000, of which nearly 500 would be new companies in the automotive field. This report includes all of the states below the Mason and Dixon line.

Georgia Sales on Increase

A remarkable increase in automotive sales in Georgia from Jan. 1 to Aug. 15, inclusive, as compared with the same period in 1922, is shown in a report by the Georgia Motor Vehicle Department, issued the latter part of August.

Up to Aug. 15, 1923, there were 141,086 passenger cars registered with the department and 18,001 commercial cars, the report shows, as compared with 119,484 passenger cars to Aug. 15, 1922, and 15,972 commercial cars. This is an increase in passenger cars of 21,602 and in trucks of 2029, and will represent proportionately the increase in automobile and truck sales made by dealers throughout the State during this period.

The cash receipts for registration to Aug. 15 of this year were \$2,048,912, which is \$240,259 larger than the same period last year.

It is now practically certain that 1923 will break all previous records in the number of automobile and truck registrations in Georgia.

Plans for Motorway in Britain Advance

(Continued from page 509)

courage the design of special types of vehicles, both trucks for carrying loads on their own platforms and tractors for hauling a maximum number of trailers. Special vehicles of this class would not leave the motorway, but light tractors will haul the individual trailers from the terminals to their destinations.

Self-contained trucks will be used in conjunction with lift-vans or containers, which will be transhipped to light vehicles at the terminals for distribution.

A further use of the motorway undoubtedly will be made by public service passenger cars, and these will not be restricted to the customary and authorized rates of speed.

The revenue of the undertaking will be derived from tolls levied upon the traffic, and as a tentative figure it is proposed to charge a rate equal to 1/2d per ton mile, which is estimated as being half the amount of the economy to be secured by vehicle owners, comparing their costs with those of running on the existing public highways.

Perfects New Light for Lincoln Highway

DETROIT, Sept. 5—Working to solve the problem of illuminating highways for night traffic, the Lincoln Highway Association has accepted a lighting system which has been developed for it by the General Electric Co. and which will be installed along the Ideal Section of the coast-to-coast trail at Dyer, Ind., near Chicago.

W. D'Arsey Ryan, chief engineer of the General Electric Co., is credited with the development of this new system, which is said to embody a new principle for collecting the light rays and casting them only where needed, which is along the roadway and not on the fields adjacent.

A nest of reflectors is provided—a series of three—one within the other. These reflectors serve to cast the light, which otherwise would be reflected upward and outward, upon the surface of the road, while at the same time shielding the direct rays from any possibility of glare in the eyes of the drivers.

The General Electric Co. engineers state that 3700 candlepower is obtained from each side of the reflector with only a 250-candlepower lamp in the fixture, which is known as the Nuvalox. The bracket holding the lamp and reflector is affixed to an ornamental pole thirty-five feet high and is adjustable in both horizontal and vertical positions, permitting the best illumination on curves and grades.

One of these units will be installed in alternate positions on each side of the road and all wires will be underground. The lamps will be controlled by an entirely automatic oil time switch, which can be adjusted to turn them on and off at any determined hour in the evening and in the morning.

The association plans to illuminate the highway from one-half hour after sunset to one-half hour before sunrise.